

REVIEW OF THE COSTA RICAN GLAPHYRIINAE (LEPIDOPTERA: PYRALOIDEA: CRAMBIDAE)

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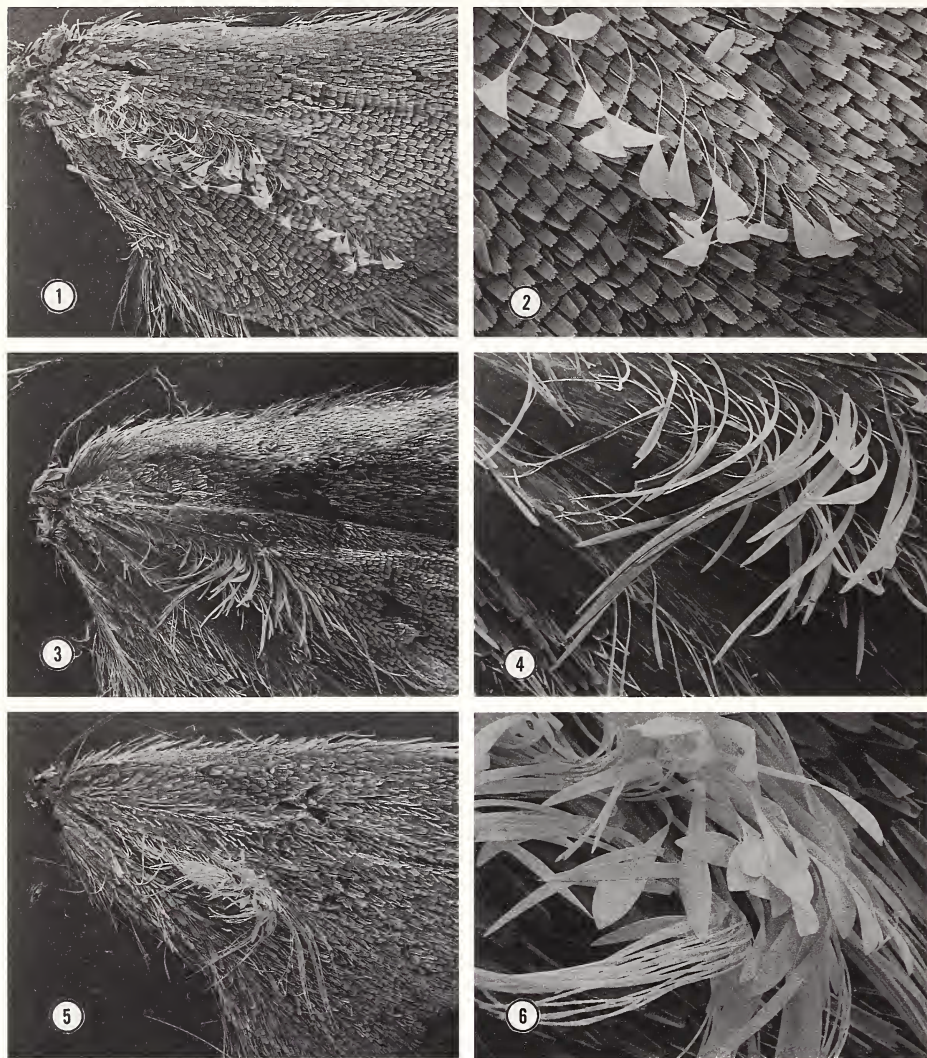
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Abstract.—Thirty-one species of Glaphyriinae (Crambidae: Pyraloidea) from Costa Rica are reviewed, including nine new species: *Aureopteryx olufsoni*, *Eupoca haakei*, *Glaphyria tetraspina*, *Glaphyria spinacrista*, *Glaphyria stellaspina*, *Glaphyria spinasingularis*, *Lipocosma rosalia*, *Lipocosma pitilla*, and *Lipocosma fonsecai*. *Lipocosma teliferalis* Dyar is a junior synonym of *Lipocosma punctissimalis* Dyar, *Lipocosma plagalis* Schaus is a junior synonym of *Lipocosma ausonialis* (Druce), and *Parambia gleanealis* Dyar is a junior synonym of *Parambia gnomosynalis* Dyar. A key to the identification of Costa Rican species is provided. The presence of a pseudognathos in the male genitalia and modified scales on the area between CuA₂ and CuP of the hind wing are discussed.

In this study of Costa Rican Glaphyriinae we review 22 described species, describe nine new species (Table 1), and provide a key for their identification. Munroe (1995) currently recognizes 161 species among 32 glaphyriine genera, and with the exception of 1 species in *Hellula* Guenée, they are New World in distribution. Munroe (1964, 1972) described 13 new genera and 32 new species from the Neotropical Region and reviewed the Nearctic species. A revision and phylogenetic analysis of the entire subfamily is greatly needed and our present study does not allow a comprehensive study. Consequently, we do not attempt to re-define the subfamily or genera within or provide evidence for the monophyly of same. See the Materials and Methods section for placement methodology within genera.

Glaphyriines have very diverse biologies and habits and their symbiotic and/or parasitic relationships with hymenopterans have attracted interest. Munroe (1972) provided a brief description of the life histories of the few known species: "the larva of *Hellula* is a leaf webber on cabbage, *Brassica oleracea* L., and other Cruciferae; that of *Dicymolomia julianalis* (Walker) lives parasitically on psychid caterpillars and apparently also in cat-tail heads (*Typha* species); that of *D. opuntalis* Dyar has been reared from prickly pear cacti (*Opuntia* species); those of *Chalcoela* species live in the nests of vespid wasps and that of *Lipocosma adelalis* (Kearfott) is a case-maker living on lichens." The biology of *Dicymolomia pegasalis* (Walker) and *Chalcoela iphitalis* Walker as parasites of *Polistes* larvae has been extensively studied and reviewed (e.g., Nelson, 1968; Rau, 1941).

Forbes (1923) first established the Glaphyriinae as part of the Pyralidae (*sensu lato*) on the basis of spatulate scales found on the upperside of the hind wing between CuA₂ and CuP. We found that the patch of specialized scales can be piliform, spatulate, or a combination of these types of scales, not just spatulate using scanning electron micrography (Figs. 1-6; Table 1). Further, Forbes (1923) stated that the spatulate scales are deciduous and visible only on fresh specimens. It is significant to note that in our study we found that some fresh specimens of neotropical species,



Figs. 1-6. 1. Hind wing of *Aureopteryx argentistriata* (Hampson). 2. Hind wing piliform scales of *Aureopteryx argentistriata* (Hampson). 3. Hind wing of *Pseudoligostigma punctissimalis* (Dyar). 4. Hind wing piliform and squamiform scales of *Pseudoligostigma punctissimalis* (Dyar). 5. Hind wing of *Lipocosma calla* (Kaye). 6. Hind wing spatulate scales of *Lipocosma calla* (Kaye).

as well as museum specimens of previously described species, lack these spatulate scales on the area between CuA_2 and CuP of the hind wing (Table 1).

Munroe (1964) followed Forbes' (1923) concept of the Glaphyriinae and expanded it by transferring genera from other pyraloid subfamilies. Munroe (1964) stated that "examination of genitalia has shown that this [the Glaphyriinae] is indeed a natural

Table 1. Costa Rican Glaphyriinae; pseudognathos present (+) or absent (-); specialized scales on hind wing present (+) or absent (-); ? = male unknown.

	Pseudognathos	Scales
<i>Aureopteryx</i> Amsel, 1956		
<i>A. argentistriata</i> (Hampson, 1917)	+	+
<i>A. olufsoni</i> Solis and Adamski, n.sp.	+	-
<i>Chilozela</i> Munroe, 1964		
<i>C. trapeziana</i> (Sepp, [1840])	-	-
<i>Cosmopterosis</i> Amsel, 1956		
<i>C. theytysalis</i> (Walker, 1859)	+	+
<i>Dicymolomia</i> Zeller, 1872		
<i>D. metalophota</i> (Hampson, 1897)	-	+
<i>Eupoca</i> Warren, 1891		
<i>E. bifascialis</i> (Walker, 1863)	-	-
<i>E. chicalis</i> (Schaus, 1920)	-	-
<i>E. haakei</i> Solis and Adamski, n.sp.	?	-
<i>E. sanctalis</i> (Schaus, 1912)	-	-
<i>Glaphyria</i> Hübner, 1823		
<i>G. citronalis</i> (Druce, 1899)	?	-
<i>G. decisa</i> (Walker, [1866])	-	+/-
<i>G. rufescens</i> (Hampson, 1912)	?	+
<i>G. spinacrista</i> Solis and Adamski, n.sp.	?	+
<i>G. spinasingularis</i> Solis and Adamski, n.sp.	-	+/-
<i>G. stellaspina</i> Solis and Adamski, n.sp.	+	+/-
<i>G. tetraspina</i> Solis and Adamski, n.sp.	+	-
<i>Hellula</i> Guenée, 1854		
<i>H. phidilealis</i> (Walker, 1859)	-	-
<i>Homophysodes</i> Dyar, 1914		
<i>H. morbidalis</i> (Dyar, 1914)	-	+
<i>Lipocosma</i> Lederer, 1863		
<i>L. albibasalis</i> (Hampson, 1906)	-	+
<i>L. ausonialis</i> (Druce, 1899)	+	+
<i>L. calla</i> (Kaye, 1901)	+	+
<i>L. fonsecai</i> Solis and Adamski, n.sp.	+	+
<i>L. furvalis</i> (Hampson, 1912)	+	-
<i>L. nigripictalis</i> Hampson, 1898	+	+
<i>L. pitilla</i> Solis and Adamski, n.sp.	+	-
<i>L. rosalia</i> Solis and Adamski, n.sp.	+	+
<i>Parambia</i> Dyar, 1914		
<i>P. gnomosynalis</i> Dyar, 1914	-	+
<i>Pseudoligostigma</i> Strand, 1920		
<i>P. argyractalis</i> (Schaus, 1912)	?	+
<i>P. enareralis</i> (Dyar, 1914)	?	+
<i>P. punctissimalis</i> (Dyar, 1914)	-	+
<i>Stegea</i> Munroe, 1964		
<i>S. hermalis</i> (Schaus, 1920)	+	+/-

and compact group . . . ,” but he did not elaborate on which characters define the subfamily. Recently, Munroe and Solis (in press) described the subfamily, summarized as follows: head (Fig. 7) with a three-segmented labial palpus, ocellus present, chaetosema absent; tympanic organ (Fig. 8) with praecinctorium simple; the wing venation and pattern as shown (Figs. 9–11), frenulum hook present in males, frenulum single in male, multiple in females; male genitalia (Figs. 12–25) with uncus well developed, gnathos reduced or absent; female genitalia (Figs. 26–35) with sclerotized collar, sometimes with additional armature. A major correction applies to this diagnosis of the Glaphyriinae with regard to the gnathos. The gnathos in the Glaphyriinae is absent; it is the pseudognathos in the Glaphyriinae that is present or absent. The pseudognathos are “structures arising from the lateral margin of the tegumen” and they may be “separate or medially fused” (Maes, 1998). When present the pseudognathos can be small lateral projections of the tegumen (as in *L. rosalia* or *A. olufsoni*) to highly modified structures fused medially with a medial projection (as in *L. fonsecai*). A phylogenetic study of the entire Glaphyriinae would elucidate the evolution of this variable structure within and between genera.

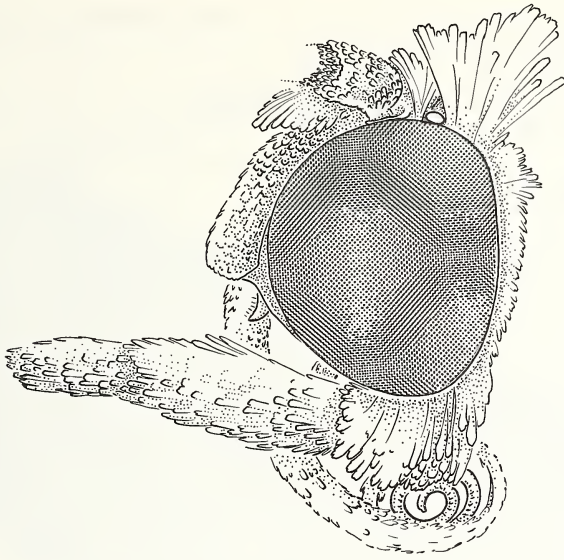
Glaphyriinae can be identified as members of the Crambidae because they have a praecinctorium (Fig. 8) and can be distinguished from the Pyralidae that lack a praecinctorium. Glaphyriines are mostly small white, yellow, brown moths (wing length generally less than 9 mm, except for *Chilozela*) and many species can be identified by the specialized scales on the area between CuA_2 and CuP of the hind wing that occur in no other subfamilies as far as known. Those species that lack these specialized scales can be confused with members of the Pyraustinae. They can be distinguished from most Pyraustinae because their praecinctorium is bilobed, and the glaphyriines have a praecinctorium with no lobes.

MATERIALS AND METHODS

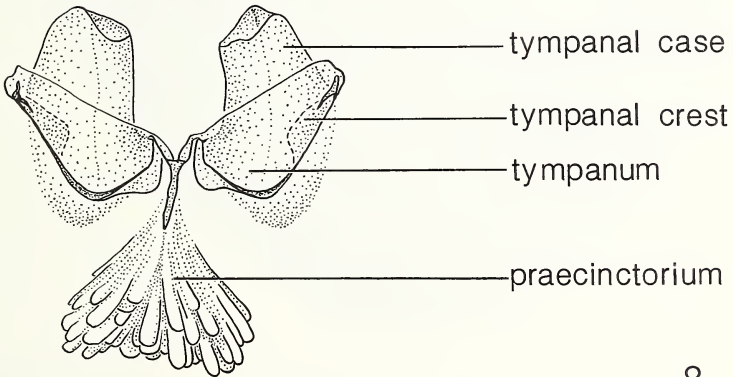
In an effort to identify those taxa with taxonomic and nomenclatural problems, we conducted a preliminary survey of pyraloids in the extensive Costa Rican collection (now incorporated into the Instituto Nacional de Biodiversidad (INBio)) of D. Janzen and W. Hallwachs. Field collection of the Pyraloidea throughout Costa Rica was accomplished by INBio parataxonomists as part of an on-going project to inventory the Pyraloidea fauna in that country.

Pinned specimens were examined with an incandescent light source (reflected light). Colors of the vestiture were described using *The Methuen Handbook of Colour* (Kornerup and Wanscher, 1983) as a standard. Male and female genital dissections were prepared following Clarke (1941), using chlorazol black and Mercurochrome as staining agents. Wings were prepared by staining with Eosin-Y and slide mounted in Canada balsam. All measurements were made with the aid of an ocular micrometer. Fore wing length is measured from the center of the axillary area to the apex of the fore wing. The label data are transcribed as on the label, the Costa Rican locality is represented by the Lambert Coordinate System (L-N or L-S) when indicated, followed by the collector(s), the INBio acronym, and the bar code number given to each specimen.

The preliminary composition of the neotropical Glaphyriinae was based on the checklist by Munroe (1995). Costa Rican specimens were dissected to identify di-

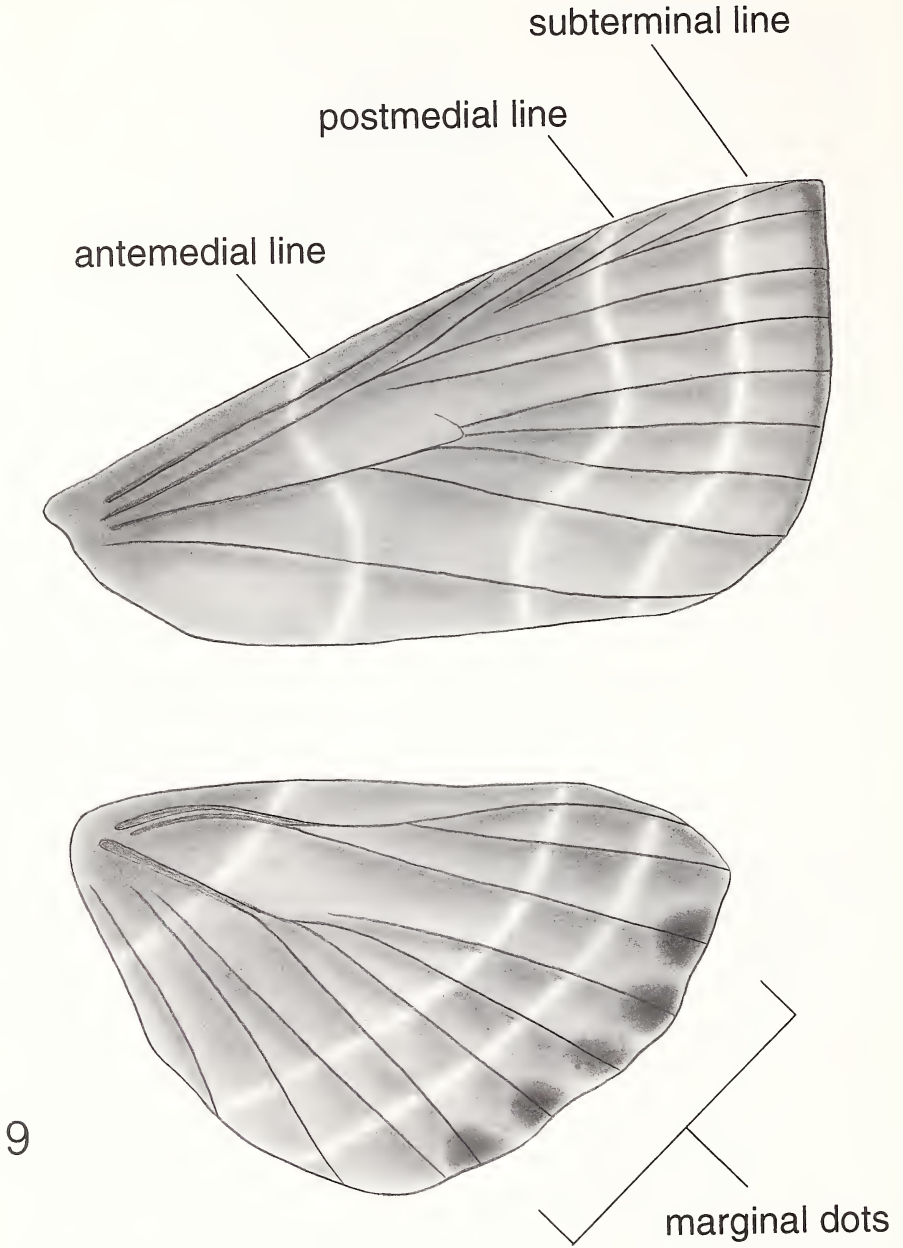


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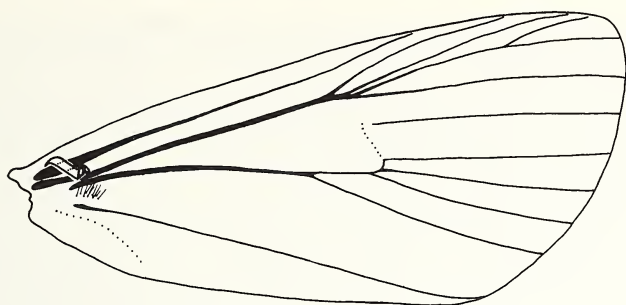


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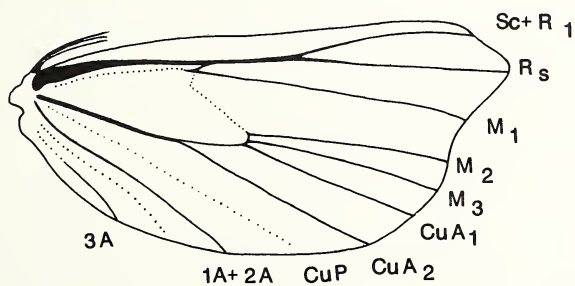
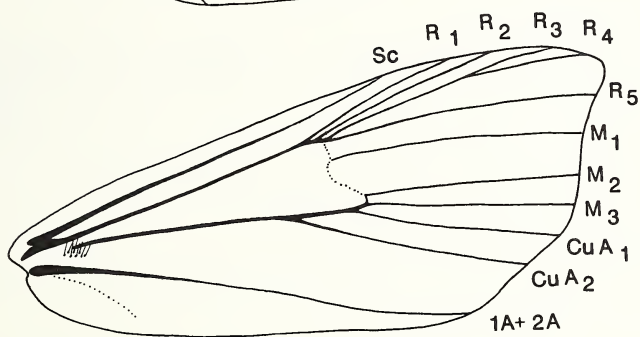
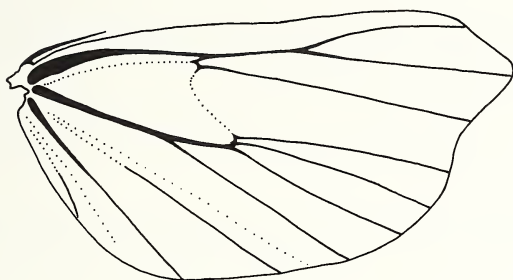
Figs. 7-8. 7. Stylized glaphyriine head. 8. Tympanic organ of *Eupoca chicalis* Schaus.



9
Fig. 9. Stylized glaphyriine wing pattern.



10



11

Figs. 10–11. 10. Male wing venation of *Lipocosma rosalia* Solis & Adamski. 11. Female wing venation of *Lipocosma rosalia* Solis & Adamski.

agnostic characters for each species because the genital characters of many Central American glaphyriine species are unexplored. Species level characters are unique to Glaphyriinae species, especially the female characters, and these are listed in the diagnosis. Because we do not attempt to re-define the genera, the placement of a new species in a genus was accomplished by comparison with type species and previous works (i.e., Munroe 1964, 1972). To determine the identity and nomenclatural status of Costa Rican species, types of neotropical species at the The Natural History Museum (BMNH), London, England, and at the National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C. were examined and dissected if external morphology was similar to Costa Rican species. The holotypes of new species are deposited in the Instituto Nacional de Biodiversidad, San Jose, Costa Rica (INBio), and paratypes are deposited in the USNM. The general distribution for each species is based on the USNM Glaphyriinae collection, the largest and most representative collection in the world.

KEY TO THE GLAPHYRIINAE OF COSTA RICA BASED ON EXTERNAL MORPHOLOGY OF THE ADULTS

- 1 In both sexes, hind wing between CuA_2 and CuP with broadly arched piliform or spatulate (very long base with a spatulate apex) scales or a combination of scales (Figs. 1–6) 2
 – Hind wing between CuA_2 and CuP without such scales. 21
- 2(1) Hind wing between CuA_2 and CuP with a combination of piliform scales intermixed with spatulate scales (Figs. 3, 55) . . . *Pseudoligostigma punctissimalis* (Dyar)
 – Hind wing between CuA_2 and CuP with linear cluster of either piliform or spatulate scales (Figs. 2, 6) 3
- 3(2) Hind wing between CuA_2 and CuP with piliform scales only (Fig. 2) 4
 – Hind wing between CuA_2 and CuP with spatulate scales only (Fig. 6) 10
- 4(3) Hind wing without marginal spots 5
 – Hind wing with marginal spots 6
- 5(4) Fore wing falcate; hind wing with subcircular brown spot near middle of discal cell (Fig. 61) *Lipocosma fonsecai* Solis & Adamski
 – Fore wing round; hind wing without spot near middle of discal cell (Fig. 50) *Glaphyria stellaspina* Solis & Adamski
- 6(4) Hind wing with marginal spots between Rs and CuA_2 or M_1 and CuA_2 (Fig. 39) *Cosmopteroris thetysalis* (Walker)
 – Hind wing with marginal spots between M_2 and CuP or M_2 and $1A+2A$ 7
- 7(6) Hind wing with six pairs of marginal spots oriented longitudinally or four marginal spots between M_2 and CuP 8
 – Hind wing with seven marginal spots between M_2 and $1A+2A$ 9
- 8(7) Hind wing with six pairs of marginal spots, each pair oriented longitudinally; fore wing with four silver streaks from middle of wing to near subterminal line and between costa and M_3 (Fig. 36) *Aureopteryx argentistriata* (Hampson)
 – Hind wing with four marginal spots between M_2 and CuP ; fore wing without streaks (Fig. 40) *Dicynolomia metalophota* (Hampson)
- 9(8) Fore wing with white or pale-brown subterminal lines (Fig. 54) *Pseudoligostigma enareralis* (Dyar)
 – Fore wing with subterminal lines suffused (Fig. 53) *Pseudoligostigma argyractalis* (Schaus)
- 10(3) Fore wing pattern with white scales 11

- Fore wing pattern with yellow scales 13
- 11(10) Fore wing basal fascia pattern with brown and white scales (Fig. 57)
 *Lipocosma albibasalis* (Hampson)
- Fore wing basal fascia unicolorous white 12
- 12(11) Rest of fore wing pale brownish-orange, lines pale brown, incomplete or absent;
 small brown spot in tornal area; hind wing with small spot near wing margin in
 anal area, subterminal line brown (Fig. 63) *Lipocosma nigripictalis* Hampson
- Rest of fore wing mostly brown, lines concolorous; no spot in tornal area; hind
 wing without spot near wing margin in anal area, subterminal line white (Fig. 66)
 *Parambia gnomosynalis* Dyar
- 13(11) Fore wing medial fascia not brown 14
- Fore wing medial fascia brown 16
- 14(13) Fore wing basal fascia completely yellow (Fig. 60) *Lipocosma calla* (Kaye)
- Fore wing basal fascia with mixed white and yellow scales 15
- 15(14) Fore wing basal fascia with mixed white and golden-yellow scales; discal spot
 mostly with brown scales (Fig. 65) *Lipocosma rosalia* Solis & Adamski
- Fore wing basal fascia with scales white basally and yellow distally; discal spot
 with mostly yellow and white scales and very few brown scales (Fig. 59)
 *Lipocosma ausonialis* (Druce)
- 16(13) Fore wing with two or three white apical streaks (Fig. 56)
 *Homophysodes morbidalis* Dyar
- Fore wing without white apical streaks 17
- 17(16) Fore wing tornal area yellow (Fig. 46) *Glaphyria decisa* (Walker)
- Fore wing tornal area brown 18
- 18(17) Fore wing brown except costa and remaining wing areas pale brown and/or yellow
 (Fig. 49) *Glaphyria spinasingularis* Solis & Adamski
- Fore wing with costa and remaining wing areas brown 19
- 19(18) Adterminal line a series of dark brown dots (Fig. 47).
 *Glaphyria rufescens* (Hampson)
- Adterminal line a series of dark brown dashes 20
- 20(19) Fore wing ground color pale brown; lines dark brown, postmedial line delineated
 by white distally, antemedial line delineated by white proximally; spatulate scales
 between CuA₂ and CuP brown only at tip of spatulate area (Fig. 48)
 *Glaphyria spinacrista* Solis & Adamski
- Fore wing ground color dark brown; lines faint, spatulate scales between CuA₂ and
 CuP with spatulate area entirely brown (Fig. 67) *Stegea hermalis* (Schaus)
- 21(1) Hind wing with four black marginal spots between M₃ and 1A+2A (Fig. 37)
 *Aureopteryx olufsoni* Solis & Adamski
- Hind wing without marginal spots 22
- 22(21) Upper surface of fore wing veins delineated by pale brown or white scales 23
- Upper surface of fore wing veins not delineated by contrastingly pigmented scales
 24
- 23(22) Upper surface of fore wing veins delineated by white scales, except anal vein
 portion distal to subterminal line (Fig. 42) *Eupoca chicalis* (Schaus)
- Upper surface of fore wing veins delineated by pale brown scales, including portion
 of anal veins distal to subterminal line (Fig. 43) *Eupoca haakei* Solis & Adamski
- 24(22) Fore wing ground color brownish-orange 25
- Fore wing with ground color brown or white 28
- 25(24) Fore wing length greater than 11 mm; basal, antemedial, and postmedial lines
 subparallel; anterior portion of outer margin of fore wing slightly emarginate (Fig.
 38) *Chilozela trapeziana* (Sepp)

- Fore wing length less than 8 mm; basal, antemedial, and postmedial lines parallel; anterior portion of outer margin of fore wing not emarginate 26
- 26(25) Fore wing with small brown spot in tornal area; wing with small spot near wing margin in anal area (Fig. 62) *Lipocosma furvalis* (Hampson)
- Without small brown spot in tornal area of fore wing or near hind wing margin in anal area 27
- 27(26) Fore wing basal fascia white, except costa with two yellow streaks; antemedial and postmedial lines brownish-orange white (Fig. 50) *Glaphyria stellaspina* Solis & Adamski
- Fore wing basal fascia brownish-orange without streaks, antemedial and postmedial lines white (Fig. 51) *Glaphyria tetraspina* Solis & Adamski
- 28(24) Fore wing with ground color white; a small brown spot near costa between subterminal and postmedial lines (Fig. 64) *Lipocosma pitilla* Solis & Adamski
- Fore wing with ground color brown; no small brown spot near costa between subterminal and postmedial lines 29
- 29(28) Fore wing with medial fascia brown, except costa and other wing areas mostly yellow or white 30
- Entire fore wing mostly brown 31
- 30(29) Fore wing costa and other wing areas mostly yellow (Fig. 46) *Glaphyria decisa* (Walker)
- Fore wing costa and other wing areas mostly white (Fig. 49) *Glaphyria spinasingularis* Solis & Adamski
- 31(29) Fore wing grayish-brown with a crescent-shaped spot near distal end of discal cell (Fig. 52) *Hellula phidilealis* (Walker)
- Fore wing not light or dark brown, without spot near discal cell 32
- 32(31) Fore wing with four small transverse yellow apical streaks (Fig. 45) *Glaphyria citronalis* (Druce)
- Fore wing without apical streaks 33
- 33(32) Fore wing antemedial and postmedial lines faint; hind wing darker brown than fore wing (Fig. 67) *Stegea hermalis* (Schaus)
- Fore wing antemedial and postmedial lines white; hind wing mostly white except subterminal line dark brown. 34
- 34(33) Fore wing with all fasciae dark brown near costa, except basal fascia light brown distally, all lines straight (Fig. 41) *Eupoca bifascialis* (Walker)
- Fore wing with apical, subapical, and tornal areas brown, basal fascia mostly light brown, all lines jagged (Fig. 44) *Eupoca sanctalis* (Schaus)

Aureopteryx Amsel

This genus includes 4 species (Munroe, 1995) and 2 occur in Costa Rica, *A. argentistriata* and a new species, *A. olufsoni*. The type species is *A. calistoalis* (Walker) described from Brazil. The placement of *Aureopteryx olufsoni* Solis and Adamski is tenuous. *Aureopteryx* species share similar wing color patterns (predominantly yellow with various metallic markings, mainly between the apical area and antemedial line of the fore wing, and metallic markings associated with marginal spots of the hind wing). The gnathos is absent, but generally the genitalia vary markedly (Figs. 12–13, 26). The male uncus may be long and basally narrow, or short and basally wide, and the valvae may be fused basally or free. The female antrum is sclerotized or membranous, the seventh sternum greatly modified or simple, the ductus bursae with or without sclerotized processes, and the signa present or absent.

These characters must be subjected to a rigorous phylogenetic analysis to determine their usefulness at the generic level.

Aureopteryx argentistriata (Hampson)

Figs. 1–2, 36

Ambia argentistriata Hampson, 1917:464.

Aureopteryx argentistriata, Munroe, 1995:44. NEW COMBINATION.

Diagnosis. Fore wing with yellow ground color and deep yellow medial and post-medial lines, subterminal line silver; four silver streaks from mid wing to near subterminal line, between costa and M_3 . Hind wing with linear cluster of dark brown piliform scales between CuA_2 and CuP , six pairs of marginal spots (each pair orientated longitudinally) between M_3 and CuA_2 . Male genitalia with uncus narrow, about half the length of valva; costa with apex produced into a single short spine. Female genitalia with signa paired, each with a forked apex.

Type. Holotype, ♂, Jimenez, W. Colombia (BMNH).

Material examined. Holotype not dissected. Other specimens examined: MEXICO: 1 ♂, El Salto. COSTA RICA: 4 ♂♂, 2 ♀♀, Est. Queb. Bonita, 50m, Res. Biol. Carara, Prov. Puntarenas, COSTA RICA, Zuniga, Ago 1990, L-N-194500-469850, COSTA RICA: INBIO: Aug. 1990-CRI18124, genitalia slide USNM 107,931, COSTA RICA: INBIO: Oct. 1989-CRI196868, Apr. 1991-CRI315596, Jun. 1991-CRI345692, Jun. 1991-CRI345695, Aug. 1989-CRI109586, Jun. 1991-CRI345697. 1 ♂, Estac. Quebrada Bonita, Prov. Puntarenas, 9/1/89-9/30/89, R. Zuniga, L-N-194500-469850, COSTA RICA: INBIO: CRI1065082. 1 ♀, Est. Sirena, 0-100m, Prov. Puntarenas, P.N. Corcovado, Oct. 91, G. Fonseca, L-S-270500-508300, COSTA RICA: INBIO: CRI348028. FRENCH GUIANA: 1 ♂, Cayenne. VENEZUELA: 1 ♀, "Fernald Coll."; 2 ♂♂, Brianas; 1 ♀, Guarico; 7 ♂♂, San Esteban. COLOMBIA: 1 ♂, Valle Palmira. PARAGUAY: 5 ♂♂, Dept. Nueva Asuncion; 1 ♂, Dept. Chaco; 2 ♂♂, Pouillon. BRAZIL: 1 ♂, Buito Prov. TRINIDAD: 1 ♀.

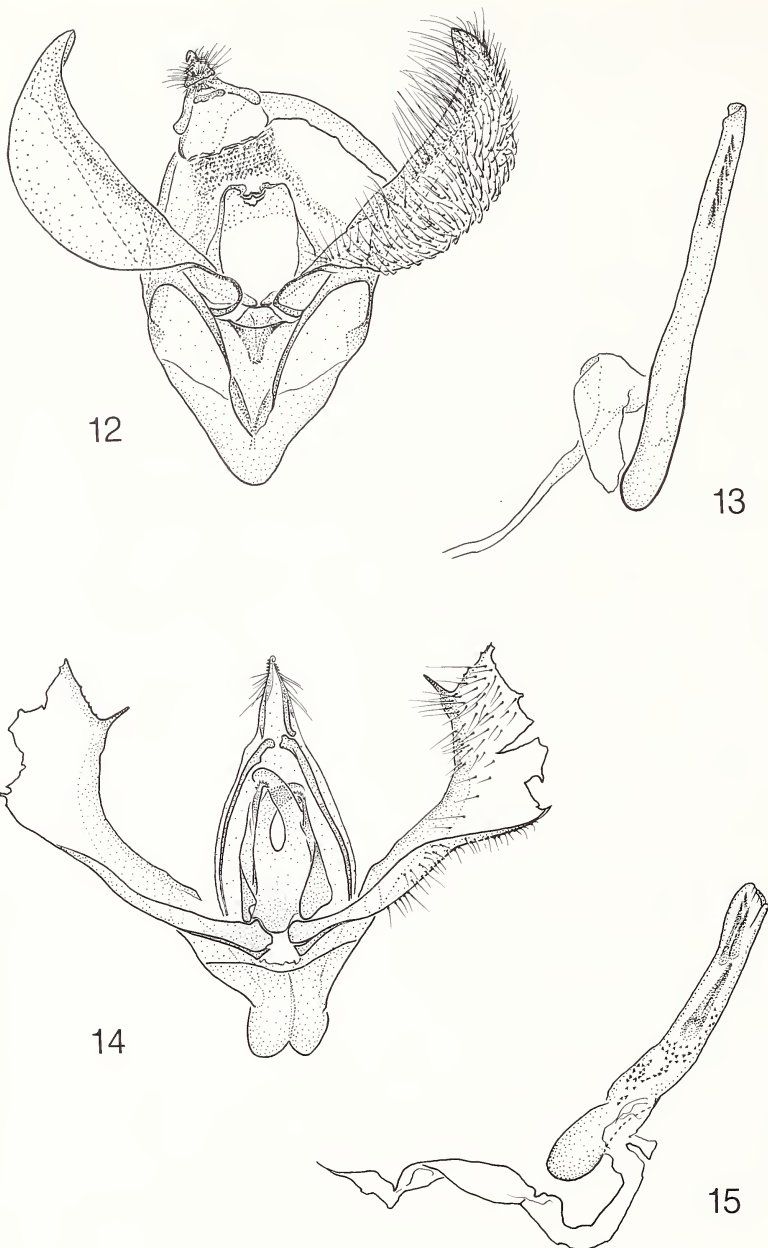
Distribution. Central Mexico south to Paraguay and Brazil, including Trinidad. In Costa Rica it is found in the lowland, Pacific areas.

Aureopteryx olufsoni, new species

Figs. 12–13, 26, 37

Diagnosis. Fore wing pale yellow with pale brown subterminal line and deep yellow antemedial line; three silver apical streaks present (partially present or absent on rubbed specimens); subterminal line on fore wing and hind wing irregular; hind wing similarly patterned as fore wing except with four small black marginal spots between M_3 and $1A+2A$. Male genitalia with valvae fused basally, costa apically flattened and inwardly curved. Aedeagus slender with cornutus several small spines. Female with anterior margin of seventh sternum deeply emarginate and with recurved anterolateral arms, signum absent.

Description. Head: Vertex and frontoclypeus mostly pale yellow intermixed with white scales (many scales are missing [rubbed] on frontoclypeus); antennal scales pale yellow basally, pale brown distally. Ocellus absent. Maxillary palpus white. Outer surface of labial palpus mostly white, except pale yellow on apical third to half of terminal segments, inner surface white. Proboscis with basal white scales.



Figs. 12–15. 12. Male genitalia of *Aureopteryx olufsoni* Solis & Adamski, USNM #103,728. 13. Aedeagus of *Aureopteryx olufsoni* Solis & Adamski, USNM #103,728. 14. Male genitalia of *Glaphyria spinasingularis* Solis & Adamski, distal end of valvae damaged, USNM #107,933. 15. Aedeagus of *Glaphyria spinasingularis* Solis & Adamski, distal end of valvae damaged, USNM #107,933.

Thorax: Tegula and mesonotum mostly white intermixed with pale yellow scales. Prothoracic leg white, except pale yellow scales on basal portion of tibia and proximal tarsomeres; apical tarsomeres, and in some specimens apical and subapical tarsomeres brown. Meso- and metathoracic legs patterned similarly as prothoracic leg. Fore wing length = 5.5–6.7 mm (N = 6). Ground color pale yellow. Three silver streaks within yellow apical area (not present or partially present on rubbed specimens). Subterminal and interneural dots brown. Brown scales demarcate discal cell radius and extend slightly beyond between R_{3+4} and R_5 . A small brown dot present near distal end of discal cell. Antemedial and basal lines yellow, both terminating near radius of discal cell. Marginal line silver, fringe scales yellow intermixed with yellowish-brown scales. Under surface mostly pale yellow, in some specimens interneural dots and anterior portion of antemedial line present. Hind wing pale yellow, subterminal line pale brown. Four marginal dots present between M_3 and $1A+2A$. Under surface pale yellow, some specimens with marginal dots with adjacent dark brown fringe scales. Area between CuA_2 and CuP without piliform or spatulate scales. Fringe scales pale yellow intermixed with yellowish-brown scales, dark brown near marginal dots.

Abdomen: Anterior portion of terga pale yellow, posterior portion white; under surface white.

Male genitalia: Uncus widened basally and hooked apically. Juxtal arms formed around aedeagus. Pseudognathos with two short lateral arms. Costa of valva apically flattened and inwardly curved. Aedeagus narrow with cornutus several small spines.

Female genitalia: Seventh tergum extended ventrally, overlapping a membranous longitudinal depression, lateral to ostium bursae. Posterior margin of seventh sternum deeply emarginate medially and with recurved anterolateral arms. Two pocketlike folds anterolateral to seventh sternum. Ostial area and ductus bursae sclerotized to near corpus bursae. Two small spinose areas within ductus bursae near inception of corpus bursae. A small fold located about equidistant to ostium bursae and eighth segment. Ductus seminalis posterior to seventh sternum.

Types. Holotype: ♀, 9.4km W.[est] Bribri, Suretka, Limon Prov.[incia] COSTA RICA, 9–11 Jun[e] 1983, 200m, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115270 [not dissected] (INBIO). Paratypes: 1 ♀, same data as holotype except, COSTA RICA: INBIO: CRI1115245, genitalia slide USNM 103,729 [green label]. 1 ♂, Sirena Corcovado Nat.[ional] P[ar]k, Osa Penin.[sula], COSTA RICA 5–11 Jan.[uary] 1981, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115246, genitalia slide USNM 103,728 [green label]. 1 ♂, Sirena, Corcovado N.[ational] P[ar]k, Puntarenas Prov.[incia], COSTA, RICA 0–100m, R. Blanco & G. Fonseca, April 1989, 270500, 508300, COSTA RICA: INBIO: CRI1103091. 1 ♂, Est.[acion] Sirena, P.N. Corcovado, 0–100m, Prov[incia] Punt.[arenas], COSTA RICA, G. Fonseca, Oct[ober] 1990, L-S-270500, 508300, COSTA RICA: INBIO: CRI179036. 1 ♂, Estac. Quebrada Bonita, 50m R.B. Carara Puntarenas Pr.[ovincia], COSTA RICA, Se[p]t[ember] 1989, R. Zuniga, 194500, 469850, COSTA RICA: INBIO: CRI1103075. 1 ♂, Est. Sirena, P.N. Corcovado, 0–100m, Prov. Puntarenas, COSTA RICA, G. Fonseca, Mar. 1991, L-S-270500-508300, COSTA RICA: INBIO: CRI447684, genitalia slide USNM 108,079 [green label].

Distribution. The southern Atlantic and Pacific lowlands of Costa Rica.

Etymology. This species is named in honor of Curtis Olufson of Texas for his support in the development of the INBio.

Chilozela Munroe

This genus is monotypic and is externally very similar to *Chilomima* Amsel, another monotypic genus with a similar distribution and food plant. The only species of *Chilozela* has been reared from the leaves of *Manihot esculenta* Crantz known as yuca or cassava (Becker, 1986; see for further host plant citations).

Chilozela trapeziana (Sepp)

Fig. 38

Phalaena (*Tortrix*) *trapeziana* Sepp [1840]:131; Becker, 1986:196. NEW COMBINATION.

Botys jatrophalis Walker, 1859:990; Becker, 1986:196. NEW SYNONYMY [Unnecessary replacement name].

Phlyctaenodes bifilalis Hampson, 1913:518. Becker, 1986:196. NEW SYNONYMY.

Diagnosis. Basal portion of frontoclypeus protracted anteriorly. Fore wing ground color brownish-orange. Costal area and fringe scales grayish-brown. All wing lines brown. Basal, antemedial, and postmedial lines subparallel, subterminal line jagged. Anterior portion of outer margin of fore wing slightly emarginate. Hind wing without piliform or spatulate scales between CuA_2 and CuP . Fringe scales of hind wing pale brown, except grayish-brown between CuA_1 and CuA_2 . Male genitalia with outer margin of valva broadly rounded, nearly semicircular. Vesica without cornutus. Female genitalia with anterior portion of ductus bursae laterally sclerotized. Corpus bursae usually with two subequal spinose patches. Smaller patch anterior to the larger patch, the former absent in some specimens.

Types. *P. bifilalis* Hampson, lectotype, ♂, Guyana (BMNH). The type specimen of *Phalaena trapeziana* Sepp is presumed lost, however, the identity of this species can be verified by examination of the color plate that accompanies the original description (Becker, 1986).

Material examined. Types not dissected. COSTA RICA: 1 ♂, Esperanza. 1 ♂, Sixola River; PANAMA: 1 ♂, Corozal; VENEZUELA: 1 ♂, Aroa; PERU: 2♂♂, Callao. 1 ♂, 1 ♀, "Peru"; GUYANA: 1 ♀, Kartabo (Bartica District); FRENCH GUIANA: 1 ♂, 1 ♀, St. Laurent du Maroni; SURINAM: 1 ♂, 1 ♀.

Distribution. Costa Rica south to Peru.

Cosmopterosis Amsel

A monotypic genus. No biological information is available.

Cosmopterosis thetysalis (Walker, 1859)

Fig. 39

Cataclysta thetysalis Walker, 1859:440; Amsel, 1956:110. NEW COMBINATION.

Diagnosis. Apical and tornal areas of fore wing brown, a subquadrate yellow spot

from costa to middle of wing and basal to subterminal line; subterminal line silver. Hind wing with a sparse linear patch of mostly white piliform scales intermixed with brown scales between CuA_2 and CuP ; five large marginal spots between R_s and CuA_2 or M_1 and CuA_2 . Male genitalia with uncus heavily sclerotized, with two featherlike apical setae; pseudognathos toothed dorsally; sclerotized juxtal arms spinose, each with a circular spinose patch posterolaterally; aedeagus spinose posterolaterally; sacculus spinose and recurved ventrally. Female genitalia with posterior portion of female antrum as wide as seventh sternum; corpus bursae with two elliptical signa.

Type. Holotype, ♂, Villa Nova [Brazil] (BMNH).

Material examined. Holotype not dissected. Other material examined: MEXICO: 5 ♂♂, 7 ♀♀, Sinaloa. 1 ♀, Magdalena Island; COSTA RICA: 5 ♂♂, 5 ♀♀, Est. Cacao, 1000–1400m, Lado SO Vol. Cacao, P.N. Guan., Prov. Guanacaste, L-N-323300-375700, C. Chaves-Sept. 1991-COSTA RICA: INBIO: CRI356851, CRI356852, CRI356853, CRI356854, CRI356855, CRI356824, CRI356826, CRI356842, CRI356903, 8–12 Oct. CRI350093. 4 ♂♂, same data as above except: D. Garcia-11 Sept.–11 Oct. 1991-COSTA RICA: INBIO: CRI349572, CRI349573, CRI349574, CRI349581. 1 ♀, same data as above except: R. Blanco-Sept. 1989-COSTA RICA: INBIO: CRI87622. 1 ♂, same data as above except: R. Blanco & C. Chaves-Sept. 1989-COSTA RICA: INBIO: CRI87645. 1 ♀, Est. Murcielago, 8km suroeste de Cuajiniquil, 100m, Prov. Guanacaste, L-N-320300-347200, I Curso Microlepidoptera-Jul. 1990-COSTA RICA: INBIO: CRI226510. 1 ♀, Est. Pitilla, 700m, 9 km S Sta. Cecilia, P.N. Guanacaste, Prov. Guanacaste, L-N-330200-380200, C. Moraga-7/15/92/ (1:00), COSTA RICA: INBIO: CRI381748. 4 ♂♂, 4 ♀♀, Est. Queb. Bonita, 50m, Res. Biol. Carara, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, Jun. 1991-COSTA RICA: INBIO: CRI345657, CRI345554, CRI345646, CRI345648, May 1990-CRI194583, Oct. 1989-CRI127283, Aug. 1989-CRI109623, Nov. 1989-CRI139469. 5 ♂♂, 1 ♀♀, Est. Sta. Rosa, 300m, P.N. Sta. Rosa, Prov. Guanacaste, L-N-313000-359800, I Curso Microlepidoptera-Jul. 1990-COSTA RICA: INBIO: CRI224096, CRI224081, CRI224082, CRI224092, CRI224097, CRI224254. 1 ♂, Estac. Pitilla, Prov. Guanacaste, L-N-330200-380200, C. Moraga & P. Rios, 9/1/89–9/30/89, COSTA RICA: INBIO: CRI104399. 1 ♀, Estac. Quebrada Bonita, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, 9/1/89–9/30/89, CRI1065549. 1 ♀, Estac. Santa Rosa, Prov. Guanacaste, L-N-313000-359800, Jul. 1990, COSTA RICA: INBIO: CRI1109032. 1 ♀, Estacion Mengo, Prov. Guanacaste, L-N-323300-375700, D.H. Janzen, 6/13/87–6/26/87, COSTA RICA: INBIO: CRI1115616. 1 ♂, same data as above except: D.H. Janzen & W. Hallwachs, 7/1/87–7/31/87, COSTA RICA: INBIO: CRI1115615. 2 ♀♀, Playa Naranjo, 0–100m, P.N. Sta. Rosa, Prov. Guanacaste, L-N-309300-354200, E. Alcazar, May-1991, COSTA RICA: INBIO: CRI386771, CRI386772. 1 ♂, same data as above except: Oct. 1990-COSTA RICA: INBIO: CRI70149, 1 ♂, Rancho Quemado, 200m, Peninsula de Osa, Prov. Puntarenas, L-S-292500-511000, F. Quesada, COSTA RICA: INBIO: CRI483369. 2 ♂♂, Santa Rosa National Park, Prov. Guanacaste, L-N-313000-359800, DH Janzen & W. Hallwachs, 20–22 May 1980-COSTA RICA: INBIO: CRI110543, CRI110540. 1 ♂, same data as above except: 1–15 Aug. 1982, COSTA RICA: INBIO: CRI1103541, 23–25 Jun. 1980, CRI1103542. 1 ♂, Sirena Corcovado, Prov. Puntarenas, L-S-270500-508300, D.H. Janzen & W. Hallwachs, 5/1/84, COS-

TA RICA: INBIO: CRI1110125. 3 ♂♂, 5 ♀♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, D.H. Janzen & W. Hallwachs, 12 July 1980-COSTA RICA: INBIO: CRI1115178, genitalia slide USNM 103, 726, COSTA RICA: INBIO: 10-12 JUL. 1980-CRI1115142, 1 May 1980-CRI1115140, 12-14 May 1980-CRI1115146, 23-25 May 1980-CRI1115151, 20-22 May 1980-CRI1115149, 7-8 May 1980-CRI1115150, 1-15 Aug. 1982-CRI1115183. 3 ♂♂, 2 ♀♀, same data as above except: D.H. Janzen, 10-12 Nov. 1979, COSTA RICA: INBIO: CRI1115139, CRI1115152, CRI1115141, 22-24 Jun. 1979, CRI1115148, 23-25 Nov. 1979, CRI1115145. 2 ♂♂, 3 ♀♀, Sirena, Corcovado National Park, Osa Peninsula, COSTA RICA, DH Janzen & W. Hallwachs, 1 May 1984-COSTA RICA: INBIO: CRI1115144, 5-11 Jan. 1981-CRI1115143, 10-12 Aug. 1980-CRI1115180, CRI1115179, CRI1115185, genitalia slide USNM 103, 727. 2 ♀♀, same data as above except: 13 Aug. 1980-CRI1115176, CRI1115177. 1 ♂, 1 ♀, Estacion Mengo, 1100m SW side Volcan Cacao, Prov. Guanacaste, COSTA RICA, 13-26 Jun. 1987, D.H. Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115138, CRI1115181. 1 ♀, 4 km E Casetilla, Rincon National Park, Prov. Guanacaste, COSTA RICA, 22 May 1982, 750m el, DH Janzen & W. Hallwachs, CRI1115147. 2 ♀♀, W of Carmona Nicoya, Prov. Guanacaste, COSTA RICA, 600-700m, 19 Aug. 1982, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115182, CRI1115184. 1 ♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, 1-15 Aug. 1982, 300m DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115159; GUATEMALA: 3 ♂♂, 7 ♀♀, Cayuga; PANAMA: 4 ♂♂, 5 ♀♀, Barro Colorado; 1 ♂, Alhajuelo; 1 ♂, Cerro Campana, near Chica; MONTSERRAT: 2 ♂♂; DOMINICA: 1 ♂, 1 ♀; FRENCH GUIANA: 2 ♂♂, St. Jean; 2 ♂♂, St. Laurent; 1 ♂, Cayenne; VENEZUELA: 4 ♂♂, 7 ♀♀, Guarica. 2 ♂, 1 ♀, Aroa. 1 ♂, Valera. 1 ♂, Brainas. 1 ♀, San Estaban. 1 ♀, Lara. 1 ♀, Aragua; PERU: 1 ♂, "Peru"; PARAGUAY: 2 ♀♀, Dept. Paraguari. 1 ♀, Dept. Concepcion.

Distribution. Western Mexico and the Caribbean islands south to Paraguay.

Dicymolomia Zeller

This genus currently includes 9 species (Munroe 1983, 1995) and occur from the United States to South America; only 1 species occurs in Costa Rica. Feeding habits are believed to be diverse for this genus (Munroe, 1972).

Dicymolomia metalophota (Hampson)

Fig. 40

Ambia metalophota Hampson, 1897:166; Munroe, 1964:1300. NEW COMBINATION.

Lipocosma consortalis Dyar, 1914; Munroe, 1972:246. NEW COMBINATION, NEW SYNONYMY.

Bifalculina argentipunctalis Amsel, 1956; Munroe, 1972:246. NEW COMBINATION, NEW SYNONYMY.

Diagnosis. Apical and tornal areas and antemedial line of fore wing brownish-orange. Outer margin of hind wing slightly emarginate near M_2 ; four black marginal spots between M_2 and CuP; a linear cluster of black piliform scales between CuA_2

and CuP. Male genitalia with outer margin of valva semicircular; a stout spine at apex of costa of valva; vesica of aedeagus with many short spines. Female genitalia with ductus bursae produced from anterior portion of corpus bursae, posterior part of ductus bursae membranous, anterior part sclerotized.

Type. *A. metalophota*, holotype, ♀, Jamaica (BMNH). *L. consortalis*, holotype, ♂, Panama, genitalia slide USNM 107,364 [green label], Type. No. 16169 [red label] (USNM). *B. argentipunctalis*, holotype, ♀, Venezuela (ZSBS).

Material examined. Holotype not dissected. Other specimens examined: GUATEMALA: 1 ♂, Quirigua; 2 ♂♂, 5 ♀♀, Cayuga; COSTA RICA: 2 ♀♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, DH Janzen, 12 Dec. 1978–10 Jan. 1979-COSTA RICA: INBIO: CRI1115154, genitalia slide USNM 103, 791, CRI1115156. 1 ♂, same data as above except: 29–31 May 1979, COSTA RICA: INBIO: CRI115153, genitalia slide USNM 103, 790. 1 ♂, same data as above except: DH Janzen & W. Hallwachs, 26–28 Jun. 1980, COSTA RICA: INBIO: CRI115155, genitalia slide USNM 107,932. 1 ♀, Est. Pitilla, 700m, 9km S Sta. Cecilia, Prov. Guanacaste, COSTA RICA, P. Rios & C. Moraga, 10 Sept.–22 Oct. 1980, L-N-330200-380200, COSTA RICA: INBIO: CRI183485. 1 ♂, Cerro Tortuguero, 0–120m, P.N. Tortuguero, Prov. Limon, L-N-285000-588000, J. Solano, Nov. 1989, COSTA RICA: INBIO: CRI140608. 1 ♀, Est. Bijagual, 500m, Res. Biol. Carara, Prov. Puntarenas, L-N-192250-474760, R. Zuniga, Nov. 1989, COSTA RICA: INBIO: CRI116292, CRI116343. 1 ♀, same data as above except: Sept. 1990, COSTA RICA: INBIO: CRI296131. 2 ♂♂, Est. Maritza, 600m, lado O. Vol. Orosi, Prov. Guanacaste, L-N-326900-373000, I Curso Microlepidoptera, Jul. 1990, COSTA RICA: INBIO: CRI179519, CRI180932. 1 ♀, Est. Murcielago, 8km SW de Cuajiniquil, Prov. Guanacaste, L-N-320300-347200, I Curso Microlepidoptera, COSTA RICA: INBIO: CRI226435. 1 ♀, Est. Pitilla, 700m, 9km S Sta. Cecilia, L-N-320200-380200, C. Moraga & P. Rios, COSTA RICA: INBIO: CRI183560. 1 ♀, same data as above except: Sept. 1989, COSTA RICA: INBIO: CRI1936. 1 ♀, same data as above except: Dec. 1989, COSTA RICA: INBIO: CRI81185. 1 ♀, same data as above except: COSTA RICA: INBIO: CRI1064369. 1 ♂, 2 ♀♀, same data as above except: P. Rios & C. Moraga, 10 Sept.–22 Oct. 1990, COSTA RICA: INBIO: CRI183484, CRI183503, CRI183507. 1 ♀, same data as above except: GNP Biodiv. Survey, 1989, COSTA RICA: INBIO: CRI111728. 1 ♀, Est. Sta. Rosa, 333m P.N., Prov. Guanacaste, L-N-313000-359800, I Curso Microlepidoptera, Jul. 1990, COSTA RICA: INBIO: CRI224013. 1 ♀, P.N. Manuel Antonio, 120m, Quepos, Prov. Puntarenas, L-S-370900-449800, G. Varela & R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI227002. 1 ♀, same data as above except: R. Zuniga, Feb. 1991, COSTA RICA: INBIO: CRI346844. 1 ♀, same data as above except: 140m, G. Varela & R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI227007. 1 ♂, 1 ♀, same data as above except: 80m, L-S-370900-448800, R. Zuniga, Feb. 1991, COSTA RICA: INBIO: CRI346913, CRI347104. 1 ♂, same data as above except: Jan. 1991, COSTA RICA: INBIO: CRI366866. 1 ♀, Sector Cerro Cocori, Fca. de E. Rojas, 150, Prov. Limon, L-N-286000-567500, E. Rojas, Mar. 1991, COSTA RICA: INBIO: CRI181536. 1 ♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, 2–11 Mar. 1980, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115160; CUBA: 4 ♂♂, 8 ♀♀, Santiago. 2 ♀♀, Sierra Maestra. 1 ♀, Havana; JAMAICA: 1

♂; GRENADA: 1 ♂; FRENCH GUIANA: 3 ♂♂, 2 ♀♀; VENEZUELA: 2 ♀♀, Valera.

Distribution. Southeastern United States, Guatemala southeast to Venezuela, including the Caribbean Islands.

Remarks. Munroe (1972) reports an unconfirmed record of *D. metalophota* feeding on *Cajanus cajan* (L.) Millsp.

Eupoca Warren

This genus includes 7 species (Munroe, 1995) and occurs from Mexico south to Brazil. Four species occur in Costa Rica: *E. bifascialis*, *E. chicalis*, *E. sanctalis* and new species, *E. haakei*. No biological information is available.

The generic placement of *Eupoca haakei* Solis & Adamski is tenuous. The wing patterns of many *Eupoca* are similar. The ground color is usually dark, and the antemedial and subterminal lines are well defined with white or pale brown scales. Some species, *E. chicalis* (Schaus) and *E. haakei*, have the fore wing veins on the upper surface delineated by lightly pigmented scales. Genital characters are problematical because several species are known only from one sex (mostly females) making even a preliminary study of these structures incomplete. Species with males known have a sclerotized, elongate costa of the valva with apical setae, and the valva is usually broad. The vinculum-saccus complex is ventrally quadrate. Cornuti are present or absent. The ductus bursae and corpus bursae may be heavily sclerotized, possessing several kinds of structures, or entirely membranous (Figs. 27–28).

Eupoca bifascialis (Walker)

Fig. 41

Nepopteryx bifascialis Walker, 1863:59; Munroe, 1964:1290. NEW COMBINATION.

Eupoca cinerea Warren, 1891:64; Munroe, 1964:1290. NEW SYNONYMY.

Diagnosis. All fasciae on fore wing dark brown near costa, except basal fascia light brown. Interneural spots dark brown. Antemedial, postmedial, and subterminal lines faint white. Male genitalia with uncus long and narrow. Valva broadened apically. Juxtal arms extending dorsolaterally to near apex of uncus. Female genitalia with posterior margin of seventh sternum rounded. Ductus bursae dorsally sclerotized, spinose posteriorly. Inner surface of corpus bursae with many stout spines laterally and less stout spines dorsoventrally.

Types. *N. bifascialis*, holotype, ♀, Brazil (BMNH). *E. cinerea*, syntype, ♂, Brazil (BMNH).

Material examined. Holotype not dissected. Other specimens examined: MEXICO: 2 ♀♀, Orizaba. 1 ♀, Jalapa; GUATEMALA: 1 ♂, 6 ♀♀, Volcan Santa Maria. 1 ♂, 2 ♀♀, Cayuga; COSTA RICA: 1 ♀, Juan Vinas. 1 ♂, 1 ♀, Turrialba. 1 ♂, 1 ♀, San Jose. 1 ♀, "Costa Rica"; ECUADOR: 2 ♂♂, "Environs de Loja"; COLOMBIA: 1 ♂, Urrao; VENEZUELA: 2 ♀♀, Aroa. 2 ♀♀, El Valle; FRENCH GUIANA: 1 ♀, St. Laurent; BRAZIL: 1 ♀, Castro; ARGENTINA: 1 ♂, Metan.

Distribution. Southern Mexico south to north central Argentina.

Eupoca chicalis (Schaus)

Figs. 8, 27, 42

Scybalista chicalis Schaus, 1920:178; Munroe, 1964:1290. NEW COMBINATION.

Diagnosis. Fore wing veins delineated by white scales, except anal veins from subterminal line; subterminal and antemedial lines white; antemedial line wider than subterminal line, apical and subapical areas brown. Hind wing uniformly gray. Male genitalia with costa of valva three thin, short apical spines; sacculus with hairlike setae. Female genitalia with posterior portion of ductus bursae membranous, anterior portion sclerotized, signum bladellike and deeply invaginated; inner surface of corpus bursae with short peglike spines, their bases fused forming a distinct sclerotized area, anterior portion membranous.

Type. Holotype, ♀, Cayuga, Guat[emala], May, Schaus and Barnes Coll[ection], genitalia slide USNM 107,901 [green label], Type No. 23528 [red label] (USNM).

Material examined. Holotype dissected. Other specimens examined: GUATEMALA: 1 ♀, Cayuga; COSTA RICA: 1 ♂, Turrialba. 1 ♀, Finca La Selva (OTS), Puerto Viejo de Sarapiquí, Prov. Heredia, 50m, COSTA RICA, 6–9 Mar. 1985, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115157, genitalia slide USNM 108,108. 1 ♀, Sirena, Corcovado National Park, Osa Peninsula, COSTA RICA, 5–11 Jan. 1981, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115158. 1 ♂, Est. Quebrada Bonita, 50m, Res. Biol. Carara, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, Aug. 1990, COSTA RICA: INBIO: CRI181205. 1 ♀, Est. Sirena, 0–100m, P.N. Corcovado, Prov. Puntarenas, L-S-270500-508300, G. Fonseca, Mar. 1991, COSTA RICA: INBIO: CRI300007. 1 ♀, Apr. 1991, COSTA RICA: INBIO: CRI475681. 1 ♀, Fca. San Gabriel, 2km S Dos Rios, Prov. Alajuela, L-N-318800-383500, GNP Biodiv. Survey, 5/1/89–5/31/89, COSTA RICA: INBIO: CRI27. 1 ♂, Quepos, 120m, P.N. Manuel Antonio, Prov. Puntarenas, L-S-370900-449800, COSTA RICA, G. Varela & R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI180495. 1 ♀, P.N. Manuel Antonio, 80m, Quepos, Prov. Puntarenas, L-S-370900-448800, R. Zuniga, Feb. 1991, COSTA RICA: INBIO: CRI347142. 1 ♀, same data as above except: Jan. 1991, COSTA RICA: INBIO: CRI366971. 1 ♂, Sirena Corcovado, N.P. Prov. Puntarenas, L-S-270500-508300, R. Blanco & G. Fonseca, 4/1/89–4/30/89, COSTA RICA: INBIO: CRI1103081. 1 ♀, Sirena, Corcovado National Park, Prov. Puntarenas, L-N-270500-508300, COSTA RICA, 100m, Nov. 1989, J. Solano, COSTA RICA: INBIO: CRI11387, genitalia slide USNM 107,934. 1 ♀, Cerro Tortuguero, P.N., Tortuguero, Prov. Limon, L-N-285000-588000, COSTA RICA, 100m, Nov. 1989, J. Solano, COSTA RICA: INBIO: CRI140671; PANAMA: 1 ♀, Barro Colorado Is.; FRENCH GUIANA: 1 ♂, St. Jean du Maroni.

Distribution. Guatemala southeast to French Guiana.

Eupoca haakei, new species

Figs. 28, 43

Diagnosis. Ground color of fore wing upper surface brown, with wing veins delineated by pale brownish-yellow scales. Female corpus bursae with accessory lobe on anterior end; signum absent.

Description. Head: Vertex with brownish-yellow scales. Frontoclypeus with pale brown scales (most specimens are missing [rubbed] scales on frontoclypeus). Antennal scape and pedicel with pale brown scales, flagellomeres with nonoverlapping pale brown scales on posterior surface. Ocellus present. Maxillary palpus pale brown. Labial palpus with basal segment mostly brown, intermixed with white and pale brown scales distally, distal segments pale brown. Proboscis with basal pale brown scales.

Thorax: Tegula brown basally, pale brown distally. Mesoscutum mostly pale brown, intermixed with brown scales. Prothoracic coxa and outer surface of femur white; inner surface of femur and tarsomeres pale brown, darker near epiphysis and basal two-thirds of first tarsomere. Pterothoracic legs white, except apex of midfemur brown. Fore wing length = 7.8–9.5 mm (N = 6). Ground color mostly brown, intermixed with white and pale brown scales. Distal portion of subterminal area pale brown. Marginal line brown. Fringe scales pale brown basally, brown distally. Under surface mostly pale brown, darker from costa to 1A+2A. Both surfaces of hind wing pale brown with brown marginal line.

Abdomen: Upper surface of each terga with a transverse median brown band, basally and distally pale brown. Under surface white, intermixed with pale brown scales.

Male genitalia: Unknown.

Female genitalia: Ductus bursae and corpus bursae entirely membranous. Corpus bursae with an accessory lobelike structure on anterior end. Ductus seminalis broadened basally.

Types. Holotype: ♀, Sirena, Corcovado Nat.[ional], P[ar]k, Osa Penin.[sula], COSTA RICA, 5–11 Jan[uary] 1981, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI115175, genitalia slide USNM 107,894 [green label] (INBIO). Paratypes: 1 ♀, same label data as holotype except; COSTA RICA: INBIO: CRI115174, genitalia slide USNM 108,107 [green label]. 1 ♀, 10–12 Aug[ust] 1980, COSTA RICA: INBIO: CRI115173. 1 ♀, P.N. Manuel Antonio, 80m, Quepos, Prov[incia] Punt[renas], COSTA RICA, G. Varela, Nov[ember] 1991, L-S-370900,448800, COSTA RICA: INBIO: CRI404017, genitalia slide 107,924 [green label]. 1 ♀, Quepos, 120m, P.N. Manuel Antonio, Prov. [incia] Punt. [renas], COSTA RICA, G. Varela & R. Zuniga, Oct[ober] 1990, L-S-370900, 440800, COSTA RICA: INBIO: CRI274834. 1 ♀, Quepos, 140m, P.N. Manuel Antonio, Prov.[incia] Punt.[renas], COSTA RICA, G. Varela & R. Zuniga, Oct[ober] 1990, L-S-371500,9450, COSTA RICA: INBIO: CRI223013 [abdomen not dissected in gelatin capsule].

Distribution. Southeastern Costa Rica at low elevations.

Etymology. This species is named in honor of Michael Haake of Texas, in recognition of George Haake's support of the development of INBio.

Eupoca sanctalis (Schaus)

Fig. 44

Scybalista sanctalis Schaus, 1912a:289; Munroe, 1964:1290. NEW COMBINATION.

Diagnosis. Fore wing with apical, subapical, and tornal areas brown; medial area

mostly light brown; antemedial and subterminal lines white, jagged. Hind wing uniformly gray with narrow marginal line. Male genitalia with valva wide distally; costa of valva with two stout, short apical apines; cornutus of vesica with two spines, the larger spine nearly the entire length of aedeagus. Female genitalia with posterior portion of ductus bursae membranous; proximal portion of ductus seminalis with a linear row of spines that bifurcates, forming an irregular ring of spines within the corpus bursae.

Type. Holotype, ♀, Jan[uary], Juan Vinas, C[osta] R[ica], genitalia slide USNM 107,900 [green label], Type No. 17564 [red label] (USNM).

Material examined. Holotype dissected. Other specimens examined: COSTA RICA: 1 ♀, Juan Vinas (paratype, specimen with abdomen missing); COLOMBIA: 1 ♂, San Antonio.

Distribution. Central Costa Rica south to northern Colombia.

Glaphyria Hübner

The entire taxon consists of 34 species in the Western Hemisphere. Seven species occur in Costa Rica: *G. citronalis*, *G. decisa*, *G. rufescens*, and 4 new species, *G. spinacrista*, *G. spinasingularis*, *G. stellaspina*, *G.* and *tetraspina*. No biological information is available.

The placement of *Glaphyria* species is based on Munroe (1972) whose diagnosis of the Nearctic *Glaphyria* is summarized as follows: male genitalia (Figs. 14–19) with a slender uncus, distally pointed and hooked ventrally; juxta deeply U-shaped with dorsal apices spinose; valva fan-shaped, with a tubular costa, ending in a short, sharp process beyond middle; aedeagus cylindrical and with cornutus; female genitalia (Figs. 29–32) with ductus bursae strengthened by a fluted sclerite; bursa pouch-like, with a diverticulum leading to the ductus seminalis. In addition, most male genitalia of *Glaphyria* have the costa of the valva sclerotized, and in both males and females the wing scale color is generally pale brown or yellow with lines white or brown bordered by white.

Glaphyria citronalis (Druce)

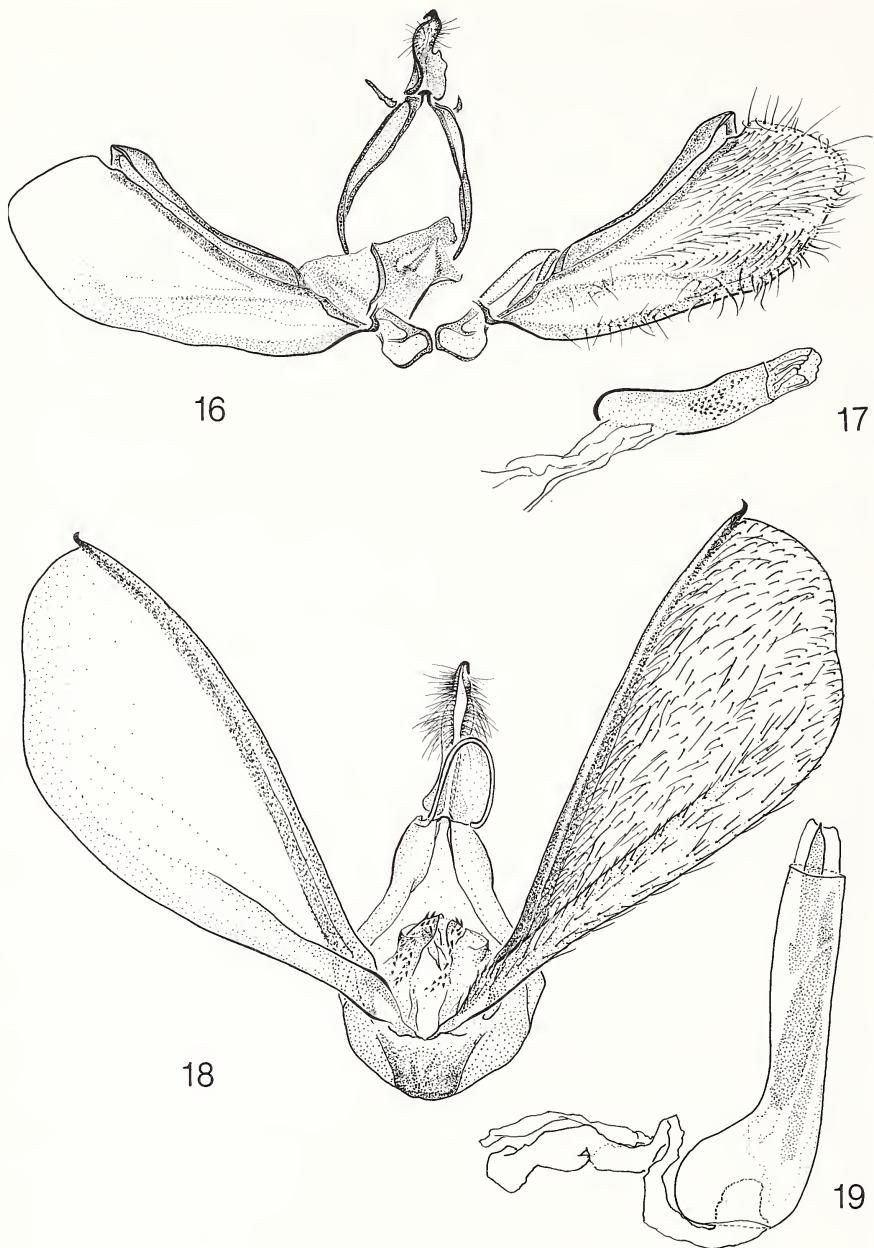
Fig. 45

Homophysa citronalis Druce, 1899:556.

Glaphyria citronalis Druce, 1899; Klima, 1939:10. NEW COMBINATION.

Diagnosis. Fore wing with four transverse yellow apical streaks. Ductus bursae and medial portion of corpus bursae of female genitalia with sclerotized pleats; base of ductus seminalis with peglike spines.

Types. *H. citronalis*, holotype, ♀, Atoyac, Vera Cruz, BM slide no. 11414 (BMNH). **Material examined.** Holotype dissected. Other specimens examined: MEXICO: 1 ♂, Atoyac, Vera Cruz; COSTA RICA: 1 ♀, Est. Bijagual, 500m, Res. Biol., Carara, Prov. San Jose, L-N-192250-474760, COSTA RICA, R. Zuniga, Sept. 1990, COSTA RICA: INBIO: CRI299452, genitalia slide USNM 107,956. 1 ♀, Quepos, 120m, P.N. Manuel Antonio, Prov. Puntarenas, L-S-370900-449800, COSTA RICA, G. Varela & R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI227960, genitalia slide USNM 107,957. 1 ♀, Est. Hitoy Cerere, 100m, R. Cerere, Res. Biol. Hitoy Cerere, Prov.



Figs. 16-19. 16. Male genitalia of *Glaphyria stellaspina*, USNM #107,920. 17. Aedeagus of *Glaphyria stellaspina*, USNM #107,920. 18. Male genitalia of *Glaphyria tetraspina*, USNM #107,935. 19. Aedeagus of *Glaphyria tetraspina*, USNM #107,935.

Limon, L-N-643400-184600, M. Barrelier, Oct. 1990, COSTA RICA: INBIO: CRI314043.

Distribution. Southeastern Mexico south to Central America and Brazil.

Remarks. Male unknown.

Glaphyria decisa (Walker)

Fig. 46

Acontia? decisa Walker, [1866]: 1963.

Homophysa pomonalis Schaus, 1920:174; Munroe, 1995:43. NEW SYNONYM.

Diagnosis. Fore wing with medial fascia brown, except costa and other wing areas mostly yellow. Hind wing area between CuA_2 and CuP with or without spatulate scales. Valva of male genitalia with a broadly rounded subapical membranous projection on costa; vinculum with vertically oriented lateral struts. Female genitalia with small membranous fold posterior to ostium bursae; margin of seventh sternum rounded and produced posteriorly; two small lateral sclerotizations within ductus bursae equidistant to ostium bursae and inception of corpus bursae; two large sclerotizations within corpus bursae, one elongate, the other subcircular and funnel-shaped.

Types. *A. decisa*, holotype, Jamaica (BMNH). *H. pomonalis* Schaus, holotype, Cayuga, Guatemala, Type No. 23518 [red label] (USNM).

Material examined. Holotypes not dissected (abdomens missing). Other specimens examined. GUATEMALA: 3 ♂♂, 5 ♀♀, Cayuga; COSTA RICA: 1 ♀, Estac. Bijagual, 500m, Res. Biol. Carara, Prov. San Jose, L-N-192250-474760, COSTA RICA, R. Zuniga, Jan. 1990, COSTA RICA: INBIO: CRI104522, genitalia slide USNM 107,940. 1 ♀, P.N. Manuel Antonio, 120m, Quepos, Prov. Puntarenas, L-S-370900-449800, R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI227888; FRENCH GUIANA: 2 ♀♀, Cayenne. 1 ♀, St. Laurent; PARAGUAY: 1 ♀, Villarrica; CUBA: 1 ♂, 2 ♀♀, Santiago. 1 ♀, Havana.

Distribution. Guatemala south to southeastern Paraguay, including Cuba.

Remarks. Hind wing area between CuA_2 and CuP with or without spatulate scales, consequently this species can be found in two different parts of the key.

Glaphyria rufescens (Hampson)

Fig. 47

Scybalista rufescens Hampson, 1912:158.

Glaphyria rufescens Hampson, 1912; Munroe, 1995:43. NEW COMBINATION.

Diagnosis. Fore wing ground color pale brown. Antemedial and postmedial lines brown, faint. Hind wing pale brown, postmedial line brown, faint; anal area with brown scales, sparsely distributed; area between CuA_2 and CuP with scales with a linear base and spatulate apex. Female genitalia with a membranous fold lateral to ostium bursae; ductus bursae sclerotized anteriorly; ductus seminalis sclerotized only at base; corpus bursae with several sclerotized longitudinal pleats.

Type. Holotype, ♀, Panama (BMNH).

Material examined. Holotype not dissected. Other specimens examined: COSTA RICA: 1 ♀, Tuis, genitalia slide USNM 107,984.

Distribution. Costa Rica south to Panama.

Remarks. Male unknown.

Glaphyria spinacrista, new species

Figs. 29, 48

Diagnosis. Fore wing and hind wing with antemedial line absent. Male genitalia unknown. Female with ductus bursae sclerotized throughout length, with a spined ridge lateral to ostium bursae, and ventrally excavated anteriorly.

Description. Head: Vertex and frontoclypeus pale brown, intermixed with white scales; antennal scales pale brown. Ocellus present. Maxillary palpus white. Outer and inner surfaces of each article of labial palpus basally and apically white with pale brown scales between. Proboscis pale brown, intermixed with brown and white scales.

Thorax: Tegula and mesonotum with pale brown scales tipped with brown. Pterothoracic leg white, except inner surfaces of femur, tibia, and tarsomere. Pterothoracic legs white. Fore wing length = 6.5–6.7 mm (N = 4). Ground color pale brown, most scales pale brown tipped with brown, intermixed with pale brown scales. Postmedial and subterminal lines brown. Postmedial line proximally demarcated with pale brown scales, subterminal line demarcated distally with similarly pigmented scales. Antemedial line present. Interneural dots elongate. Distal scales of fringe mostly white or pale brown tipped with brown, intermixed with white scales, and next inner line of fringe scales pale brown tipped with brown. Under surface similarly patterned, except for the absence of postmedial line and the presence of a small brown dot in cell. Hind wing similarly patterned as fore wing, except antemedial line absent. Area between CuA₂ and CuP with elongate, spatulate scales, each scale pale brown tipped with brown. Under surface similarly patterned as fore wing.

Abdomen: Scales mostly pale brown intermixed with pale brown scales tipped with brown.

Male genitalia: Unknown.

Female genitalia: Papillae anales laterally flattened. One pocketlike structure in membrane posterior to ostium bursae. Posteroventral margin of seventh segment sclerotized and emarginate. Ductus bursae sclerotized throughout length, with a spined ridge lateral to ostium bursae, and ventrally excavated anteriorly. Area between inception of ductus seminalis and inception of ductus bursae with linear spines, spines in a short irregular row. Midventral portion of corpus bursae with small spines, mid-dorsal portion with sclerotized pleats, anterior part of corpus bursae membranous.

Types. Holotype: ♀, Santa Rosa National Park, Guanacaste Pro. [vincia], COSTA RICA, 2–11 Mar[ch] 1980, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1103537, genitalia slide USNM 107,919 [green label]. (INBIO). Paratypes: 1 ♀, same data as holotype except; COSTA RICA: INBIO: CRI1109320, genitalia slide USNM 103,672 [green label]. 1 ♀, same data as holotype except; COSTA RICA: INBIO: CRI1109319. 1 ♀, On bait, waterhole, Santa Rosa Nat.[ional] P[ar]k Prov.

[incia], Guanacaste, COSTA RICA, DH Janzen 5–14 Mar[ch] 1979, COSTA RICA: INBIO: CRI1109317.

Distribution: Northwestern Costa Rica.

Etymology. The species epithet is from the spined ridge of the ostium bursae in the female genitalia: Latin “spina” meaning thorn and “crista” meaning ridge.

Glaphyria spinasingularis, new species

Figs. 14–15, 30, 49

Diagnosis. Fore wing pale brown, except medial fascia brown. Costa of valva with apex produced into a single stout spine; vinculum ventrally bilobed. Female seventh sternum produced posteriorly into a medial lobe.

Description. Head: Vertex and frontoclypeus mostly yellow intermixed with white scales or mostly white intermixed with yellow scales. Antennal scape white, flagellum with alternating white and pale brown scales. Ocellus present. Maxillary palpus white. Outer surface of articles of labial palpus basally and apically white with yellow between; inner surface paler or white. Proboscis with white basal scales.

Thorax: Tegula and mesonotum mostly white intermixed with yellow. Inner surface of most thoracic leg segments and tarsomeres basally yellow, distally white; outer surface mostly white intermixed with yellow and/or pale brown scales. Fore wing length = 6.3–7.3 mm (N = 4). Most wing scales basally white, apically brown. Medial fascia pale brown. Subterminal and antemedial lines white, the latter faint. Some specimens have yellow scales intermixed with pale brown scales along costa. Marginal line pale brown, proximally bordered by white. Fringe scales pale brown or white. Under surface uniform in pattern, except apical area yellow, intermixed with pale brown scales, and a small brown spot in cell. Hind wing with anal and cubital areas pale brown. Postmedial line white, faint. Marginal line pale brown. Fringe scales as fore wing. Area between CuA₂ and CuP with or without spatulate scales, and if present they are basally white, tipped with white.

Abdomen: Upper surface scales white, tipped with brown, intermixed with white scales.

Male genitalia: Uncus with apex hooked ventrally. Vinculum ventrally bilobed. Costa of valva recurved; apex of costa produced into a single stout spine, laterally dilated at base. Juxta elongate and distally spinose. Cornutus with three spines.

Female genitalia: Eight pocketlike structures in membrane posterior to ostium bursae. Seventh sternum with a medial and two lateral lobes. Ductus bursae membranous posteriorly, sclerotized anteriorly. Corpus bursae with anterior portion spinose.

Types. Holotype: ♀, Santa Rosa National Park, Guanacaste Prov.[incia], COSTA RICA, 2–4 May 1980, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI110931, genitalia side USNM 103,785, [green label] (INBIO). Paratypes: 1 ♂, Santa Rosa Nat.[ional] P[ar]k, Prov.[incia], Guanacaste, COSTA RICA, 7–9 Nov[ember] 1979, D.H. Janzen, COSTA RICA: INBIO: CRI1109314, genitalia slide USNM 107,933 [green label]. 1 ♀, Santa Rosa National Park, Guanacaste Prov.[incia], COSTA RICA, 23–25 May 1980, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109316. 1 ♀, Santa Rosa National Park, Guanacaste

Prov.[incia], COSTA, RICA, 20–22 May 1980, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109315.

Distribution: Northwestern Costa Rica.

Etymology. The specific epithet is based on the presence of a spine on the costa of the male valve: Latin "spina" meaning spine and "singularis" meaning single.

Remarks. Area between CuA₂ and CuP with or without spatulate scales, consequently this species can be found in two different parts of key.

Glaphyria stellaspina, new species

Figs. 16–17, 31, 50

Diagnosis. Fore wing with antemedial fascia brownish-orange, except for yellow along costa; basal fascia white, except two yellow streaks along costa. Membranous valva extending beyond sclerotized costa. Anterior portion of corpus bursae with a network of spines, each spine with a stellate base.

Description. Head: Vertex and frontoclypeus white, some specimens with a yellow streak from inner margin of antennal socket to lateral margin of frontoclypeus. Antennal scales pale yellow. Ocellus present. Basal articles of maxillary palpus yellow, terminal article white. Outer surface of labial palpus with mostly white scales on basal article, intermixed with yellow scales apically, terminal articles mostly yellow, intermixed with brownish-yellow scales; inner surface white. Proboscis with basal white scales.

Thorax: Tegula and mesonotum mostly white intermixed with yellow scales. Prothoracic leg white, except for yellow scales on inner surfaces of femur, tibia, and all tarsomeres. Pterothoracic legs white, except for yellow scales on inner surfaces of tibia and tarsomeres, except for white apex. Fore wing length = 5.7–6.1 mm (N = 3). Antemedial and subterminal fasciae brownish-orange, except for yellow costa. Basal fascia white, but with two yellow costal streaks. Medial fascia white, one specimen with brown along posterior margin. Antemedial and postmedial lines brown posteriorly, obscure anteriorly. Marginal line brownish-orange, proximally demarcated with white scales. Fringe scales brownish-orange. Under surface with veins streaked with yellowish-brown scales; interneural areas white, except for brown patches in subterminal area. Hind wing with semitranslucent white scales basally, pale yellowish-orange scales distally to wing margin. Marginal scales brownish-orange. Fringe scales pale yellowish-brown. Area between CuA₂ and CuP with or without pale yellowish-brown piliform scales. Under surface patterned as fore wing.

Abdomen: Mostly white, intermixed with yellow scales, white underneath.

Male genitalia: Uncus apically hooked ventrally. Pseudognathos composed of two free arms, each basally fused dorsolaterally to tegumen. Vinculum ventrally bilobed, laterally dilated to costal base. Costa sclerotized, inwardly angled. Valva membranous, extending beyond costa. Ventral margin and median longitudinal portion of valva moderately heavily sclerotized. Juxta subtrapezoidal. Aedeagus ventrally angled, small spinules on vesica.

Female genitalia: Papillae anales laterally flattened. Eight to nine pocketlike structures in membrane posterior to ostium bursae. Ductus bursae dilated laterad to ostium bursae, fusing with posterolateral margin of seventh sternite. Anterior portion of

ductus bursae sclerotized. Corpus bursae posteriorly membranous and anteriorly with a network of spines.

Types. Holotype: ♂, Cerro Tortuguero 0–120m, P.N. Tortuguero, Prov.[incia], Limon COSTA RICA, R. Delgado, Ene 1992, L-N-285000.588000, COSTA RICA: INBIO: CRI332172, genitalia slide USNM 107,920 [green label]. Paratypes: 1 ♀, Est. [acion] Cuatro Esquinas, P.N. Tortuguero, 0m, Prov.[incia], Limon, COSTA RICA, J. Solano, Oct[ober] 1990, L-N-280000.5905000, COSTA RICA: INBIO: CRI178922, genitalia slide USNM 105,822 [green label]. 1 ♀, same data as previous paratype except COSTA RICA: INBIO: CRI178955, genitalia slide USNM 107,921 [green label]. All paratypes deposited in the USNM.

Distribution. Northeastern Costa Rica.

Etymology. The species epithet is derived from the spines with a stellate-shaped base on the corpus bursae: Latin “stella” meaning star and “spina” meaning spine.

Remarks: Area between CuA₂ and CuP with or without pale yellowish-brown piliform scales, consequently this species can be found in two different parts of key.

***Glaphyria tetraspina*, new species**

Figs. 18–19, 32, 51

Diagnosis. Fore wing with antemedial and postmedial lines present (the former may be obscure). Costa of valva with apex produced into a short recurved spine; cornutus four large spines. Ductus bursae long, sclerotized; inception of ductus bursae on anterior part of corpus bursae.

Description. Head: Vertex white (in one specimen pale brown), except pale brown scales tuft near base of antenna; frontoclypeus mostly white, intermixed with pale brown scales medially. Antenna white. Ocellus present. Outer surface of maxillary palpus pale brown basally, white apically, or mostly white except pale brown on second article only, inner surface white. Outer surface of labial palpus with pale brown, except for white apices of second and third articles, inner surface white. Proboscis with basal white scales.

Thorax: Tegula and mesonotum mostly pale brown basally, intermixed with white scales, white distally. Prothoracic leg white, except pale brown on inner surfaces of femur, tibia, and basal tarsomeres. Pterothoracic legs white. Fore wing length = 5.6–6.9 mm (N = 5). Ground color brownish-orange; postmedial and subterminal lines white; antemedial line white or obscure. All lines when present demarcated with brown scales. Brown interneural dots present in one specimen only. Fore wing margin brown. Inner fringe scales with basal half pale brown, distal half brown; outer fringe scales white. Under surface pale brown with brown scales demarcating proximal side of subterminal line. A small brown dot present in cell. Interneural dots present in most specimens. Hind wing mostly white basally with pale brown scales demarcating postmedial line. A small brown dot present in cell. Area between postmedial line and wing margin with mostly brown scales, except white anal area. Wing margin brown; fringe scales as fore wing. Under surface pale brown, interneural dots present in most specimens. Area between CuA₂ and CuP without piliform or spatulate scales.

Abdomen: Upper surface of segments pale brown basally, white distally; under surface white.

Male genitalia: Uncus slightly constricted near basal third, terminating distally into an apical hook. Pseudognathos a narrow ringlike structure fused dorsolaterally to tegumen. Vinculum with a rectangular-shaped protuberant rim near posterior margin. Juxta narrowed basally, with spinose dorsal extensions. Costa of valva sclerotized, distally produced into a recurved apical spine. Lower margin of valval base overlapped by upper portion. Entire valva mostly membranous, except for costa. Aedeagus angled basally; cornutus with four large spines.

Female genitalia: Membrane posterior to ostium bursae with nine small pocketlike structures, oriented along median longitudinal body axis. Ductus bursae sclerotized, longitudinally pleated, laterally dilated fusing with posterior margin of seventh sternum. Area surrounding inception of ductus bursae similarly pleated. Ductus seminalis originates on posterior portion of corpus bursae; an irregular row of spines originates from base of ductus seminalis and continues in a spiral pattern to base of ductus bursae. A second spinose area on other side of ductus bursae, posterior to accessory bursae.

Types. Holotype: ♂, Santa Rosa Nat.[ional] P[ar]k., Prov.[incia], Guanacaste, COSTA RICA, 16–18 Nov[ember] 1979, D.H. Janzen, COSTA RICA: INBIO: CRI1109321, genitalia slide USNM 107,935 [green label]. Paratypes: 1 ♀, Santa Rosa National Park, Guana.[caste] Prov.[incia], COSTA RICA, 19–21 Jun[e] 1979, D.H. Janzen, COSTA RICA: INBIO: CRI1109322, genitalia slide USNM 107,936 [green label]. 1 ♀, Santa Rosa National Park, Guanacaste Prov.[incia] COSTA, RICA, 13–15 Jul[y] 1980, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109323. 1 ♀, Santa Rosa National Park, Guana.[caste] Prov.[incia], COSTA RICA, 22–24 July 1979, D.H. Janzen, COSTA RICA: INBIO: CRI1109324. 1 ♀, Santa Rosa National Park, Guanacaste Prov.[incia], COSTA, RICA, 2–4 May 1980, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109318.

Distribution. Northwestern Costa Rica.

Etymology. The species epithet refers to the four spines that are the cornutus on the male aedeagus: Greek “tetra” meaning four and Latin “spina” meaning spine.

Hellula Guenée

The entire fauna of this genus is composed of 6 species in the Western Hemisphere (Munroe 1983, 1995) and one species in Europe (*H. undalis* F.). Only one species, *H. phidilealis* (Walker), occurs in Costa Rica. Two species, *H. phidilealis* and *H. rogatalis* (Hulst), are serious pests of Cruciferae in the Western Hemisphere, but larvae have also been reared on Amaranthaceae and Portulacaceae.

Hellula phidilealis (Walker, 1859)

Fig. 52

Leucochroma? *phidilealis* Walker, 1859:972; Munroe, 1964:1261. NEW COMBINATION.

Phyatocosma trypheropa Meyrick, 1936:323; Munroe, 1972:200. NEW COMBINATION, NEW SYNONYMY.

Diagnosis. Fore wing with a crescent-shaped grayish-brown spot near distal end of cell. Ventral margin of valva produced into a long spine, costa elbowed nearly 45

degrees. Ductus bursae flat, membranous near ostium bursae, remaining portion sclerotized, corpus bursae spinose posteriorly and membranous anteriorly.

Types. *L. phidilealis*, holotype, ♂, Venezuela (BMNH). *P. trypheropa*, holotype, ♀, Venezuela (BMNH).

Material examined. Holotypes not dissected. Other specimens examined: MEXICO: 1 ♀, Guadalajara; GUATEMALA: 2 ♂♂, Cayuga; EL SALVADOR: 2 ♂♂, St. Andres. 1 ♂, 3 ♀♀, Rio el Palmar (near La Libertad); COSTA RICA: 1 ♂, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, DH Janzen & W. Hallwachs, 25–27 Jul. 1980, COSTA RICA: INBIO: CRI115162, genitalia slide USNM 107,952. 1 ♀, same data as above except: 7–9 Jul. 1980, COSTA RICA: INBIO: CRI115161, genitalia slide USNM 103,725. 1 ♀, Cerro Tortuguero, 0–120m, P.N. Tortuguero, Prov. Limon, L-N-285000-588000, J. Solano, Oct. 1989, COSTA RICA: INBIO: CRI31764. 1 ♀, Est. Maritza, 600m, lado O Vol. Orosi, Prov. Guanacaste, L-N-326900-373000, I Curso Microlepidoptera, Jul. 1990, COSTA RICA: INBIO: CRI180963. 1 ♀, Est. Sta. Rosa, 300m, P.N. Sta. Rosa, Prov. Guanacaste, L-N-313000-359800, I Curso Microlepidoptera, Jul. 1990, COSTA RICA: INBIO: CRI224091. 2 ♂♂, same data as above except: COSTA RICA: INBIO: CRI224007, CRI224090. 1 ♂, Fca. Cafrosa, 1300m, Est. Las Mellizas, P. Internac. La Amistad, Prov. Puntarenas, M.M. Chavarria, Jan. 1991, COSTA RICA: INBIO: CRI380485. 1 ♀, P.N. Manuel Antonio, 120m, Quepos, Prov. Puntarenas, R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI180483. 1 ♀, same data as above except: G. Varela & R. Zuniga, Dec. 1990, COSTA RICA: INBIO: CRI229151. 1 ♂, same data as above except: Oct. 1990, COSTA RICA: INBIO: CRI223077. 1 ♀, Santa Rosa National Park, Prov. Guanacaste, D.H. Janzen, 12/12/78–1/10/79, COSTA RICA: INBIO: CRI1103538. 1 ♂, Sirena, Corcovado Nat. Pk., Prov. Puntarenas, L-S-270500-508300, DH Janzen, 8/10/80–8/12/80, COSTA RICA: INBIO: CRI1103539. 2 ♂♂, San Jose Prov.; PANAMA: 1 ♀, Corozal; VENEZUELA: 1 ♂, 2 ♀♀, Zulia. 2 ♀♀, San Carlos; FRENCH GUIANA: 3 ♂♂, 3 ♀♀, Cayenne. 1 ♂, 1 ♀, St. Jean. 1 ♀, St. Laurent; COLOMBIA: 1 ♂, Caqueta; BRAZIL: 1 ♂, Pernambuco; CUBA: 2 ♀♀, Santiago. 1 ♂, Tanama; DOMINICAN REPUBLIC: 2 ♂♂, 1 ♀, Dajabon Prov.; JAMAICA: 2 ♂♂, St. Andrew Parish. 6 ♀♀, "Jamaica". 2 ♀♀, Portland Parish; PUERTO RICO: 1 ♂, Pta. Jacinto. 1 ♀, Isabela. 1 ♀, Mayaguez; ST CROIX: 2 ♂♂, 3 ♀♀, Expt. Sta.; DOMINICA: 2 ♂♂, 10 ♀♀, Clarke Hall; GRENADA: 2 ♀♀, Jamaica.

Distribution. Southern United States, southwestern Mexico to northern South America, including several islands in the Caribbean.

Homophysodes Dyar

A monotypic genus. No biological information is available.

Homophysodes morbidalis Dyar

Fig. 56

Homophysodes morbidalis Dyar, 1914:296.

Diagnosis. Fore wing with medial fascia and tornal area brown, except costa and other wing areas mostly yellow; two or three narrow and white apical streaks present.

Hind wing with a linear cluster of scales between CuA_2 and CuP , each scale with a very long base and spatulate apex. Vinculum v-shaped; costa of valva with an apical spine, pointing vertically. Posterior margin of seventh sternum truncate; anterior half of ductus bursae sclerotized, posterior half membranous; a sclerotization with free ribbonlike arms within corpus bursae.

Type. *H. morbidalis*, holotype, ♂, Trinidad Riv[er], Pan [ama], genitalia slide USNM 107,970 [green label], Type No. 16212 [red label] (USNM).

Material examined. Holotype dissected. Other specimens examined: GUATEMALA: 1 ♂, 1 ♀, Cayuga; COSTA RICA: 1 ♂, Quepos, 120m P.N. Manuel Antonio, Prov. Puntarenas, L-S-370900-449800, COSTA RICA, G. Varela & R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI180560, genitalia slide USNM 107,937. 1 ♀, Sirena, Corcovado Nat. Pk., Osa Peninsula, COSTA RICA, DH Janzen & W. Hallwachs, 10–12 Aug. 1980, COSTA RICA: INBIO: CRI1115191. 1 ♀, Sirena, Corcovado Nat. Pk. Osa Peninsula, COSTA RICA, DH Janzen & W. Hallwachs, 10–12 Aug. 1980, COSTA RICA: INBIO: CRI1115165. PANAMA: 1 ♂, Coraza. 1 ♀, Rio Trinidad.

Distribution. Guatemala south to Panama.

Lipocosma Lederer

This genus consists of 25 species (Munroe 1972, 1995) that are primarily neotropical in distribution. Eight species occur in Costa Rica: *L. albibasalis* (Hampson), *L. ausonialis* (Druce), *L. calla* (Kaye), *L. furvalis* (Hampson), *L. nigripictalis* Hampson, and 3 new species, *L. fonsecai*, *L. pitilla*, and *L. rosalia*. Two species have larvae that build cases that resemble the oak-encrusted lichens upon which they live; adult wing patterns also resemble the white lichen-encrusted oak trees (Munroe, 1972).

Three species have been placed in *Lipocosma* because they share a combination of several characters found in species figured by Munroe (1964, 1972). These characters include a body covered with mostly white scales, and male genitalia (Figs. 20–24) with a slender uncus (except *L. pitilla*), bifid juxta, and marginate valva. In addition, we found most species in this genus have a pseudognathos with a dorso-medial projection. Munroe (1964) stated that the genus is fairly homogenous, however we have found much variation.

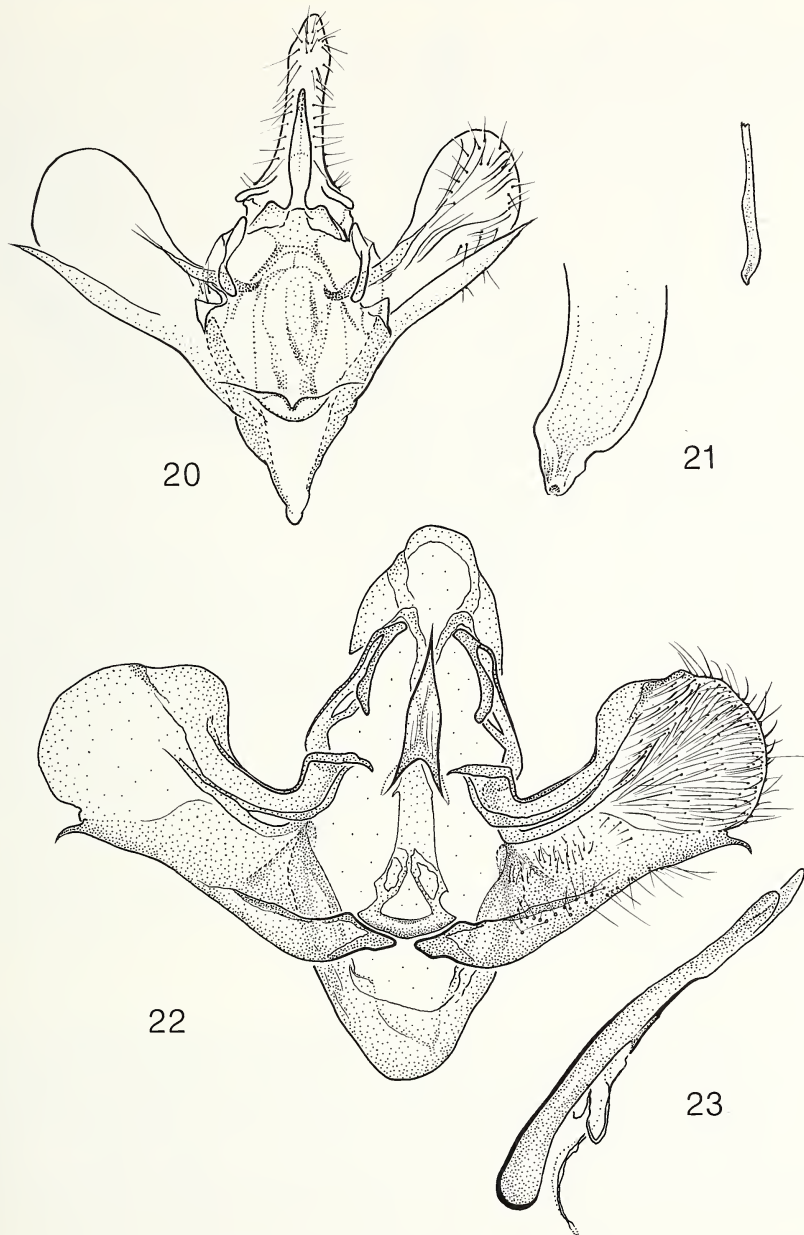
Lipocosma albibasalis (Hampson)

Fig. 57

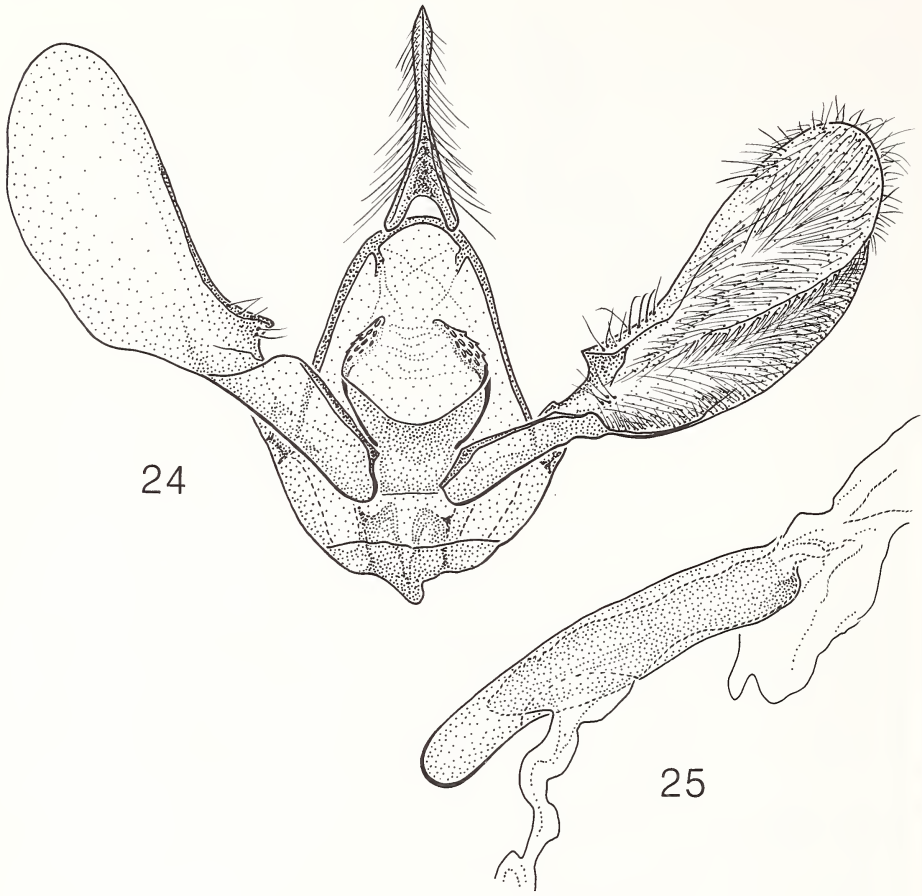
Ambia albibasalis Hampson, 1906:461; Munroe, 1995:44. NEW COMBINATION.

Diagnosis. Fore wing ground color white, all fasciae and lines pale brown, incomplete or absent. Hind wing with slight emargination near M_1 ; a dense, linear cluster of scales between CuA_2 and CuP ; scales with a very long base and spatulate apex, base white, apex brown. Costa of valva with a short dorsal projection about two-thirds length of valva. Outer margin of seventh sternum sclerotized except along median longitudinal axis; antrum timbal-shaped; accessory bursae originates from lateral part of corpus bursae.

Type. Holotype. ♂, Brazil, Sao Paulo (BMNH).



Figs. 20–23. 20. Male genitalia of *Lipocosma fonsecai*, USNM #107,922. 21. Aedeagus of *Lipocosma fonsecai*, USNM #107,922. 22. Male genitalia of *Lipocosma pitilla*, USNM #107,927. 23. Aedeagus of *Lipocosma pitilla*, USNM #107,927.



Figs. 24–25. 24. Male genitalia of *Lipocosma rosalia*, USNM #103,782. 25. Aedeagus of *Lipocosma rosalia*, USNM #103,782.

Material examined. Holotype not dissected. Other specimens examined: COSTA RICA: 1 ♀, Sirena, Corcovado Nat. Pk., Osa Peninsula, COSTA RICA, DH Janzen & W. Hallwachs, 13 Aug. 1980, COSTA RICA: INBIO: CRI1115193, genitalia slide USNM 107,943. 1 ♀, Est. Quebrada, Bonita, 50m, Res. Biol. Carara, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, Jun. 1991, COSTA RICA: INBIO: CRI348983. 1 ♀, Est. Sirena, 0–100m, P.N. Corcovado, Prov. Puntarenas, L-S-270500-508300, G. Fonseca, Apr. 1991, COSTA RICA: INBIO: CRI288619. 1 ♂, same data as above except: Sept. 1991, COSTA RICA: INBIO: CRI357588. 1 ♂, same data as above except: Mar. 1991, COSTA RICA: INBIO: CRI365671. 1 ♀, Estac. Quebrada Bonita, Prov. Puntarenas, L-N-194500-469850, G. Varela, Aug. 1990, COSTA RICA: INBIO: CRI181020. 1 ♂, same data as above except: R. Zuniga, Apr. 1989, COSTA RICA: INBIO: CRI1111682. 2 ♀♀, 1 ♂, P.N. Manuel Antonio, 120m, Quepos, Prov. Puntarenas, L-S-370900-449800, G. Varela & R. Zu-

niga, Dec. 1990, COSTA RICA: INBIO: CRI228714, CRI229263, CRI229085. 2 ♂♂, P.N. Manuel Antonio, 140m, Quepos, Prov. Puntarenas, L-S-371500-449450, G. Varela & R. Zuniga, Oct. 1990, COSTA RICA: INBIO: CRI222994, CRI223170. 1 ♀, P.N. Manuel Antonio, 80m, Quepos, Prov Puntarenas, L-S-370900-448800, R. Zuniga, Feb. 1991, COSTA RICA: INBIO: CRI347182. 2 ♂♂, same data as above except: COSTA RICA: INBIO: CRI346901, CRI346906. VENEZUELA: 1 ♂, Caracas; BRAZIL: 1 ♂, Sao Paulo.

Distribution. Costa Rica south to coastal Brazil.

Lipocosma ausonialis (Druce)

Figs. 58–59

Glaphyria (?) *ausonialis* Druce, 1899:561; Klima, 1939:10. NEW COMBINATION.
Lipocosmia plagalis Schaus, 1912a:290. NEW SYNONYMY.

Diagnosis. Fore wing with posterior third of medial fascia dark brown, forming a rectangular spot. Hind wing with a linear cluster of scales between CuA_2 and CuP , each scale with a very long base and spatulate apex. Pseudognathos present; costa of valva sclerotized with apex spinelike; apical third of costa with small, heavily sclerotized spines; aedeagus with a knoblike protrusion $\frac{2}{3}$ distance from ductus ejaculatorius. Female with seventh sternum semicircular, with fold within intersegmental membrane; corpus bursae with a linear sclerotization near signum; medial part of corpus bursae with long pleated sclerotizations.

Types. *G. ausonialis*, holotype, ♀, Las Mercedes, Guatemala, genitalia slide USNM 108,042 [green label] (BMNH). *L. plagalis*, holotype, ♀, Juan Vinas, C[osta] R[ica], genitalia slide USNM 107,893 [green label], Type No. 17545 [red label] (USNM).

Material examined. Holotypes dissected. Other specimens examined: MEXICO: 1 ♀, Coatepec (abdomen glued to label). 1 ♀, Tehuacan; GUATEMALA: 1 ♂, 1 ♀, Volcan Sta. Maria. COSTA RICA: 1 ♀, (abdomen missing), 1 ♀, Juan Vinas [Cartago Prov.]. 1, sex unknown (abdomen missing), Carillo.

Distribution. Guatemala south to central Costa Rica.

Lipocosma calla (Kaye)

Figs. 5–6, 60

Neurophyseta calla Kaye, 1901:153.

Homophysa calla Kaye, 1901; Dyar, 1914:256. NEW COMBINATION.

Glaphyria calla Kaye, 1901; Klima, 1939:10. NEW COMBINATION.

Lipocosma calla Kaye, 1901; Munroe, 1964:1302. NEW COMBINATION.

Diagnosis. Fore wing and hind wing mostly pale yellow to yellow-orange; wing lines pale brown, incomplete or absent. Hind wing with a dense linear cluster of scales between CuA_2 and CuP , bases linear and white, apices spatulate and yellow. Costa of valva with two apical spines, both on a common linear stalk, another spine near base of apical stalk; aedeagus distally curved. Posterior margin of seventh sternum deeply emarginate.

Type. *N. calla*, holotype, ♂, Trinidad (BMNH).

Material examined. Holotype not dissected. Other material examined: MEXICO: 1

♀, Santa Rosa. 1 ♀, Panuco; GUATEMALA: 1 ♂, 1 ♀, Cayuga; COSTA RICA: 1 ♂, Cerro Tortuguero, 0–120m, P.N. Tortuguero, Prov. Limon, L-N-285000-588000, J. Solano, Mar. 1991, COSTA RICA: INBIO: CRI358848. 1 ♂, Est. Bijagual, 5000m, Res. Biol. Carara, Prov. Puntarenas, L-N-192250-474760, R. Zuniga, Sept. 1990, COSTA RICA: INBIO: CRI299461. 1 ♀, Est. Magsasay, 200m, P.N. Braulio Carrillo, L-N-264600-531000, R. Aguilar, Sept. 1990, COSTA RICA: INBIO: CRI484434. 1 ♀, Est. Pitilla, 700m, 9km S Sta. Cecilia, P.N. Guanacaste, Prov. Guanacaste, L-N-330200-380200, C. Moraga, 5/2/92–5/15/92, COSTA RICA: INBIO: CRI405663. 2 ♂♂, same data as above except: P. Rios, Jun. 1991, COSTA RICA: INBIO: CRI315380, CRI346788. 2 ♂♂ same data as above except: C. Moraga, 5/2/92–5/15/92, COSTA RICA: INBIO: CRI405670, CRI405668. 1 ♂, same data as above except: 27 Jul.–14 Aug. 1992, COSTA RICA: INBIO: CRI393805. 1 ♂, same data as above except: P. Rios, 6/1/91–6/30/91, COSTA RICA: INBIO: CRI315380. 3 ♀♀, Est. Quebrada Bonita, 50m, Res. Biol. Carara, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, Aug. 1990, COSTA RICA: INBIO: CRI181141, CRI181090, CRI181003. 1 ♂, 7 ♀♀, Est. Sirena, 0–100m, Puntarenas, P.N. Corcovado, Prov. Puntarenas, L-S-270500-508300, G. Fonseca, Apr. 1991, COSTA RICA: INBIO: CRI288719, CRI475945, CRI475945, CRI288659, CRI288716, CRI288735, CRI288742, CRI288744. 1 ♀, same data as above except: Mar. 1991, COSTA RICA: INBIO: CRI365453. 1 ♀, same data as above except: Sept. 1991, COSTA RICA: INBIO: CRI357527. 1 ♀, same data as above except: Oct. 1991, COSTA RICA: INBIO: CRI348319. 1 ♀, same data as above except: COSTA RICA: INBIO: CRI351694. 1 ♀, same data as above except: Dec. 1991, COSTA RICA: INBIO: CRI381078. 1 ♂, same data as above except: Jul. 1991, COSTA RICA: INBIO: CRI334897. 2 ♂, Estac. Quebrada Bonita, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, Sept. 1989, COSTA RICA: INBIO: CRI1103074, CRI1055202. 1 ♂, 1 ♀, Fca. San Gabriel, 2km SW Dos Rios, Prov. Alajuela, L-N-318800-383500, GNP Biodiv. Survey, COSTA RICA: INBIO: CRI478, CRI216. 1 ♀, P.N. Manuel Antonio, 120m, Quepos, Prov. Puntarenas, L-S-370900-449800, G. Varela & R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI228089. 1 ♂, same data as above except: Dec. 1990, COSTA RICA: INBIO: CRI228855. 1 ♂, 1 ♀, same data as above except: 140m, G. Varela & R. Zuniga, Oct. 1990, COSTA RICA: INBIO: CRI223127, CRI223245. 1 ♀, same data as above except: L-S-370900-448800, 80m, R. Zuniga, Jan. 1991, COSTA RICA: INBIO: CRI366935. 1 ♂, Rancho Quemado, 200m, Peninsula de Osa, Prov. Puntarenas, L-S-292500-511000, F. Quesada, Dec. 1990, COSTA RICA: INBIO: CRI342754. 1 ♀, Sector Cerro Cocori, Fca. de E. Rojas, Prov. Limon, L-N-286000-567500, E. Rojas, Jan. 1992, COSTA RICA: INBIO: CRI332861. 1 ♀, same data as above except: Apr. 1991, COSTA RICA: INBIO: CRI452302. 1 ♀, same data as above except: Nov. 1991, COSTA RICA: INBIO: CRI460094. 1 ♂, Est. Pitilla, 700m, 9km S Sta. Cecilia, P.N. Guanacaste, Prov. Guanacaste, L-N-330200-380200, P. Rios, Jun. 1991, COSTA RICA: INBIO: CRI315169. 1 ♀, Finca La Selva (OTS), Puerto Viejo de Sarapiquí, Prov. Heredia, 50m, COSTA RICA, DH Janzen & W. Hallwachs, Nov. 1982, COSTA RICA: INBIO: CRI1115217. 1 ♂, same data as above except: 6–9 Mar. 1985, COSTA RICA: INBIO: CRI1115194, genitalia slide USNM 103,670. 1 ♂, 1 ♀, Finca San Gabriel, 630m, 16km E Quebrada Grande, Prov. Alajuela, COSTA RICA, DH Janzen & W. Hallwachs, 12 Mar. 1983, COSTA RICA: INBIO: CRI1115196, CRI1115195, gen-

italia slide USNM 103,671. 2 ♂♂, Fca. San Gabriel, 2km SW Dos Rios, Prov. Alajuela, L-N-318800-383500, COSTA RICA, 600m, GPN Biodiv. Survey, May 1989, COSTA RICA: INBIO: CRI737, CRI648. 2 ♂♂, Est. Sirena, P.N. Corcovado, 0–100m, Prov. Puntarenas, L-S-270500-508300, COSTA RICA, G. Fonseca, Oct. 1990, COSTA RICA: INBIO: CRI179062, CRI179193. 1 ♀, same data as above except: Dec. 1990, COSTA RICA: INBIO: CRI297343. 1 ♂, Cerro Tortuguero, P.N. Tortuguero, 0–100m, Prov. Limon, L-N-285000-588000, COSTA RICA, J. Solano, Mar. 1991, COSTA RICA: INBIO: CRI197597. 1 ♀, same data as above except: 100m, R. Aguilar & J. Solano, Apr. 1989, COSTA RICA: INBIO: CRI103080. 1 ♂, 120m, P.N. Manuel Antonio, Prov. Puntarenas, L-S-370900-449800, COSTA RICA, G. Varela & R. Zuniga, Dec. 1990, COSTA RICA: INBIO: CRI229162. 1 ♂, same data as above except: L-S-371500-449450, 140m, Oct. 1990, COSTA RICA: INBIO: CRI222874. 1 ♂, 1 ♀, Sector Cerro Cocori, Fca. de E Rojas, Prov. Limon, L-N-286000-567500, COSTA RICA, E. Rojas, Mar. 1991, COSTA RICA: INBIO: CRI181529, CRI181517. 1 ♂, same data as above except: 150m, Mar. 1992, COSTA RICA: INBIO: CRI364106, CRI363325, genitalia slide USNM 107,944. 1 ♀, Estac. Bijagual, 500m, Res. Biol. Carara, Prov. San Jose, L-N-192250-474760, R. Zuniga, Dec. 1989, COSTA RICA: INBIO: CRI1456, 1 ♀, Est. Magsasay, P.N. Braulio Carrillo, 200m, Prov. Heredia, L-N-264600-531100, R. Aguilar, Sept. 1990, COSTA RICA: INBIO: CRI484434. 1 ♀, same data as above except: M. Zumbado, Oct. 1990, COSTA RICA: INBIO: CRI180694. 1 ♂, Estac. Quebrada Bonita, 50m, R.B. Carara, Prov. Puntarenas, L-N-194500-469850, COSTA RICA, R. Zuniga, Aug. 1989, COSTA RICA: INBIO: CRI109566. 1 ♂, Est. Maritza, 600m, Lado oeste del Volcan Orosi, Prov. Guanacaste, L-N-326900-373000, I Curso Microlepidoptera, Jul. 1990, COSTA RICA: INBIO: CRI179522. 1 ♂, Est. Pitilla, 700m, 9km S Sta. Cecilia, P.N. Guanacaste, Prov. Guanacaste, L-N-330200-380200, COSTA RICA, C. Moraga, 2–15 May 1992, COSTA RICA: INBIO: CRI405670. 1 ♀, Est. Bonita, 50m, Res. Biol. Carara, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, Nov. 1989, COSTA RICA: INBIO: CRI139646. 1 ♀, Est. Sirena, 0–100m, P.N. Corcovado, Prov. Puntarenas, L-S-270500-508300, G. Fonseca, Jul. 1991, COSTA RICA: INBIO: CRI334851. 1 ♀, Turrialba; PANAMA: 1 ♂, Porto Bello; 2 ♀♀, Rio Trinidad; FRENCH GUIANA: 1 ♂, 5 ♀♀, Cayenne.

Distribution. Southern Mexico south through Central America to northern South America.

Lipocosma fonsecai, new species

Figs. 20–21, 33, 61

Diagnosis. Fore wing falcate; hind wing with a brown spot in cell. Valva broadly rounded apically; lower margin of valva produced into a single spine; vinculum V-shaped. Corpus bursae with two signa, each with several long spines.

Description. Head: Vertex and frontoclypeus mostly white, intermixed with brown scales; a tuft of brown scales near antennal bases along inner margin. Antennal scape white, flagellum white or pale brown. Ocellus absent. Outer surface of articles of maxillary palpus white basally, apically brown; inner surface white. Labial palpus similarly scaled. Proboscis pale brown, intermixed with white scales basally.

Thorax: Tegula mostly white basally with white scales tipped with brown or pale

brown scales apically. Anterior mesonotum with pale brown scales tipped with brown distally, white posteriorly. Inner surfaces of most segments and tarsomeres of thoracic legs basally pale yellowish-brown or yellowish-brown, distally white; outer surfaces white. Fore wing length = 6.4–6.7 mm (N = 5). Basal fascia mostly white, intermixed with brown scales. Antemedial, medial, and subterminal fasciae yellowish-brown, their associated lines white. Marginal line yellowish-brown. Fringe scales yellowish-brown, with mostly white marginal scales toward falcate apex. Under surface similarly patterned, but darker, or veins streaked yellowish-brown with inter-neural areas with brown scales intermixed with yellowish-brown and white scales. Area along posterior margin with white scales in some specimens. Hind wing with both surfaces similarly patterned as fore wing, but with a brown spot in discal cell. Area between CuA_2 and CuP with white piliform scales.

Abdomen: Upper surface mostly white, intermixed with white scales tipped with brown. Under surface white.

Male genitalia: Uncus slightly constricted near middle. Pseudognathos with a dorsomedial projection and apical area spinose. Vinculum v-shaped. Costa of valva not greatly sclerotized. Valva broadly rounded. Ventral margin of valva produced into a single spine. Posterior margin of juxta laterally expanded into a narrow projection.

Female genitalia: Ductus bursae posteriorly membranous, anteriorly sclerotized. Corpus bursae with two circular signa, each with several long spines. A ringlike sclerite located posterior to signa.

Types. Holotype: ♀, Est.[acion] Sirena, P.N. Corcovado, 0–100m, Prov.[incia] Punt.[arenas], COSTA RICA, G. Fonseca, Mar[ch] 1991, L-S-270500.508300, COSTA RICA: INBIO: CRI365650 [not dissected] (INBIO). Paratypes: 1 ♂, F[in]ca Cafrosa, Est.[acion] Las Mellizas, P.N. Amistad, Puntarenas Pr.[ovincia], COSTA RICA, 1300m, Novem[ber], 1989, M. Ramirez & G. Mora, L-N-316100.596100, COSTA RICA: INBIO: CRI156955, genitalia slide USNM 107,922. 1 ♀, F[in]ca San Gabriel 2km SW, Dos Rios, 600m, Prov.[incia] Alaj.[uela], COSTA RICA, I Curso, Microlepidop.[tera], Jul[y] 1990, 318800.383500, COSTA RICA: INBIO: CRI181994, genitalia slide USNM 107,923; 1 ♀, F[in]ca Cafrosa, Est.[acion] Las Mellizas, P.N. Amistad, 1300m, Prov.[incia] Punt.[arenas], COSTA RICA, M. Ramirez, & G. Mora, Oct[ober] 1990, L-S-316100.596100, COSTA RICA: INBIO: CRI1109059. 1 ♀, Est.[acion] Sirena, P.N. Corcovado, 0–100m, Prov.[incia] Punt.[arenas], COSTA RICA, G. Fonseca, L-S-270500.508300, COSTA RICA: INBIO: CRI183300.

Distribution: Costa Rica.

Etymology. The specific epithet honors the collector of the holotype and various paratypes: Mr. Gilberto Fonseca.

Lipocosma furvalis (Hampson)

Fig. 62

Homophysa furvalis Hampson, 1912:156; Munroe, 1995:44.

Diagnosis. Fore wing brownish-orange distally, grading to pale brownish-orange basally. Antemedial, postmedial, and submarginal lines faint, demarcated by faint white scales laterally. Hind wing area between CuA_2 and CuP without piliform or

spatulate scales. Pseudognathos present; costa of valva developed into a spine projecting inward to near tegumen; vesica cornutus with several spine, largest spine nearly equal length of aedeagus. Corpus bursae with spinose anterior and posterior ends, membranous medially; ductus bursae sclerotized entire length. Ductus seminalis sclerotized basally.

Type. Holotype, ♀, Mexico, genitalia slide USNM 108,041 [green label] (BMNH).

Material examined. Holotype dissected. Other specimens examined: GUATEMALA: 1 ♀, Cayuga; COSTA RICA: 1 ♂, Tuis; BARBADOS: 1 ♀.

Distribution. Mexico south to Costa Rica and the Lesser Antilles.

Lipocosma nigripictalis Hampson

Fig. 63

Lipocosma nigripictalis Hampson, 1898:612.

Diagnosis. Fore wing with basal fascia white, remaining wing area pale brownish-orange; lines pale brown, incomplete or absent; a small spot in tornal area. Hind wing mostly light brown, a small spot near wing margin in anal area; a linear cluster of scales between CuA_2 and CuP , each scale with white linear base and brown spatulate apex. Pseudognathos present; costa of valva apically recurved; outer margin of valva broadly rounded, uncus slightly hooked ventrally. A spiralled, bandlike sclerotization from anterior end of ductus bursae to posterior part of corpus bursae to ductus seminalis; midsection of corpus bursae with peglike spines with stellate bases, anterior portion of corpus bursae membranous.

Type. Holotype, ♂, Espiritu Santo, Brazil (BMNH).

Material examined. Holotype, not dissected. Other specimens examined: MEXICO: 1 ♀, Orizaba; COSTA RICA: 1 ♀, Estac. Quebrada Bonita, 50m, R.B. Carara, Prov. Puntarenas, L-N-194500-469850, COSTA RICA, R. Zuniga, Sept. 1989, COSTA RICA: INBIO: CRI1103082, genitalia slide USNM 107,954. 1 ♀, 4km E Casetilla, Rincon Nat. Pk. Prov. Guanacaste, COSTA RICA, DH Janzen & W. Hallwachs, 6 Jun. 1981, COSTA RICA: INBIO: CRI1115197. 1 ♂, Fca. Cafrosa, 1300m, Est. Las Mellizas, P. Inter. La Amistad, Prov. Puntarenas, L-S-316100-596100, M.M. Charria & G. Mora, Jan. 1991, COSTA RICA: INBIO: CRI380701. 1 ♀, Quebrada Segunda, P.N. Tapanti, 1250m, Prov. Cartago, L-N-194000-559800, G. Mora, Oct. 1991, COSTA RICA: INBIO: CRI441487. 1 ♂, Sector Cerro Cocori, Fca. de E Rojas, 150m, Prov. Limon, L-N-286000-567500, E. Rojas, Mar. 1992, COSTA RICA: INBIO: CRI363692. 2 ♂♂, 2 ♀♀, Turrialba; ECUADOR: 1 ♂, Quevedo; VENEUELA: 1 ♀, Rancho Grande.

Distribution. Southern Mexico south to Brazil.

Lipocosma pitilla, new species

Figs. 22–23, 34, 64

Diagnosis. Fore wing with a small brown subcostal spot between subterminal and postmedial lines. Uncus with a medial triangular projection; ventral margin of valva produced into a short recurved spine. Female with two ventrolateral arms in intersegmental membrane between segments seven and eight; ostium bursae ventrally

emarginate; ductus bursae with a ringlike sclerotization posterior to ductus seminalis; signum small and globular.

Description. Head: Head and its appendages white, except for a basolateral dark spot on the terminal article of the maxillary palpus. Ocellus absent. Proboscis with basal white scales.

Thorax: Tegula and mesonotum white, except for some brown near base of fore wing. All thoracic legs white, except in one specimen with inner surface of tibia pale brown. Fore wing length = 6.8–7.4 mm (N = 4). Ground color white; postmedial and subterminal lines brown, antemedial lines pale brown or absent; a small brown subcostal spot between subterminal and postmedial lines. The holotype has a wide pale brown diagonal streak from subcostal spot to tornus. Inner fringe scales with basal half white, distal half pale brown; outer fringe scales mostly white intermixed with pale brown scales. Under surface as above, but paler. Hind wing with lines pale brown, areas between lines mostly white intermixed with pale brown scales. Under surface as above, but paler. Area between CuA₂ and CuP without piliform or spatulate scales.

Abdomen: Mostly white intermixed with pale brown scales.

Male genitalia: Uncus with a broadly rounded apex. Uncus lateral arms ventromedially with an elongate subtriangular projection; pseudognathos abruptly terminates into two broad lateral arms. Vinculum broad. Costa of valva broadly extending medially, sclerotized and curved, and terminating as a small anteriorly reflexed hook, possibly attached to anellus. Costa slightly dilated dorsally near the apical ridge. Saccus setose with lower margin of valva produced into a short recurved spine. Median part of valva with short setae, apically with longer hairlike setae. Juxta subtrapezoidal basally with an elongate dorsal process. Aedeagus narrow, cornutus absent.

Female genitalia: Sterigma with two narrow lateral arms that broadly extend ventrolaterally and converge beyond ostium bursae, but do not fuse; ostium bursae deeply emarginate ventrally. Setose area posterior to dorsal margin of ostium bursae. Ductus bursae membranous throughout. A small ringlike structure posterior and proximal to inception of ductus seminalis. Corpus bursae membranous; signum small and globular.

Types. Holotype: ♂, Est.[acion] Pitilla, 700m, 9km S[outh], S[an]ta Cecilia, P.N. Guana.[caste] Prov.[incia] Guan.[acaste], COSTA RICA, C. Mora, Ago 1991, L-N-330200, 380200, COSTA RICA: INBIO: CRI537816 [not dissected] (INBIO). Paratypes: 1 ♂, Estac.[ion] Pitilla, 700m, 9km S[outh], Santa Cecilia, Guanac.[aste] Pr.[ovincia], COSTA RICA, May 1989, GNP Biodiversity Survey, 330200, 380200, COSTA RICA: INBIO: CRI9229, genitalia slide USNM 107,927. 1 ♀, same data as holotype except: COSTA RICA: INBIO: CRI9153, genitalia slide USNM 107,928. 1 ♂, same data as holotype except: COSTA RICA: INBIO: CRI9236 [not dissected]. 1 ♀, Estac. Bijagual, 500m, Res. Biol. Carara, Prov. San Jose, COSTA RICA, Nov. 1989, R. Zuniga, L-N-192250-474760. All paratypes in USNM.

Distribution: Costa Rica.

Etymology. The specific epithet is based on the name of the locality of the holotype and paratypes, Estacion Pitilla.

Lipocosma rosalia, new species

Figs. 10–11, 24–25, 35

Diagnosis. A large costal process near base of male valva and female signum with three flat arms, each with a single row of spines.

Description. Head: Vertex and frontoclypeus uniformly lustrous white (hereinafter referred to as white), some specimens mostly white intermixed with pale grayish-yellow scales. Antenna white. Ocellus present. Maxillary palpus and inner surface of labial palpus white, outer surface white, except for pale grayish-yellow scales intermixed with brown scales near apical area of segment one, and pale grayish-yellow scales near apical area of segment two. Proboscis with basal white scales.

Thorax: Tegula and mesonotum grayish-brown, inner margin white. Anterior half of mesoscutum grayish-yellow, posterior half white. Prothoracic legs white, or white with outer surface of femur and tibia intermixed with grayish-yellow scales apically; tarsomeres white, or basal tarsomeres grayish-brown; distal tarsomeres white. Outer surfaces of pterothoracic legs white; inner surface of mesothoracic femur and tibia white, or mostly white with grayish-yellow, or grayish-yellow scales intermixed with pale brown and brown scales near apex; tarsomeres white, or mostly white with grayish-yellow scales near apex. Inner surface of metathoracic leg as above. Fore wing length = 4.8–6.5 mm (N = 10); slightly falcate. Ground color lustrous white. Submarginal, postmedial, antemedial lines, and basal patch yellow, golden yellow at different angles; discal spot brown. An irregular brownish pattern between the submarginal and subterminal lines, and subterminal and antemedial lines. Area between wing margin and submarginal line grayish-yellow. Fringe scales grayish-yellow tipped with brown. Under surface as above, but paler. R_3 and R_4 stalked distally (Fig. 11). M_1 closer to R_5 than to M_2 . Cubitus 4-branched. 1A+2A prominent. 3A faint. Male retinaculum hook from base of Sc. Hind wing with ground color white. Submarginal and postmedial lines, discal spot (white in center), wing margin and fringe as above. An irregular grayish-yellow pattern between submarginal and postmedial lines. Grayish-yellow scales demarcate lower half of discal spot, extending to postmedial line. Area between CuA_2 and CuP with spatulate scales, forming a tuft; scales with pale brown or white elongate bases, tipped with brown. Under surface as above, but paler. Outer margin expanded between $Sc+R_1$ and M_1 , forming a rounded apex at Rs . $Sc+R_1$ separate along length of cell, uniting just beyond cell. Cubitus 4-branched. Male with 1A distally only two-thirds length of wing; 2A complete; 3A only present halfway to margin of wing. Female with 1A absent and 2A and 3A complete. Three acanthae fused along entire length of frenulum to form one bristle in males; acanthae diverge subapically, three bristles separate in females.

Abdomen: Upperside pattern same as underside, except terminal segments, which are uniform grayish-yellow. First tergum white, other terga (except terminal segments) grayish-yellow anteriorly, white posteriorly. Under surface mostly white intermixed with grayish-yellow scales.

Male genitalia: Uncus narrowed gradually from basal arms to near midlength, posterior surface keeled on distal half. Tegumen thin. Pseudognathos two very short lateral arms. Vinculum with a slightly protuberant saccus. Saccus extends dorsolaterally fusing with dorsal part of vinculum and ventral part of tegumen. Valva with costa heavily sclerotized; a large costal process articulates with vinculum; valva

membranous. Inner surface of valva setose, outer surface less setose, with sparsely distributed scale sockets. Lateral arms of juxta curve dorsally, forming an open circlelike structure, distal portion of each arm with slightly raised triangular projections. Aedeagus moderately heavily sclerotized throughout length. Cornutus absent.

Female genitalia: Papillae anales laterally flattened. Ostium bursae within membrane overlaid by posterior portion of seventh sternum. Seventh tergum extends beyond posterior margin of seventh sternum, with short posterolateral arms produced ventrally. Antrum sclerotized, developed into a protuberant rim posteriorly, slightly narrowed anteriorly. Ductus bursae short. Signum with three flattened arms, two extending anteriorly from base of ductus bursae, on ventral surface of corpus bursae, and one on dorsal surface of corpus bursae at same level as other two. Each arm with free ends broadly rounded and demarcated by a single row of elongated spines. Ductus seminalis from posterior end of corpus bursae; spiralled, wide at base, narrowed distally.

Types. Holotype: ♂, Santa Rosa National Park, Guanacaste Provincia, COSTA RICA, 23–25 Jun[e] 1980, D. H. Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109306, genitalia slide USNM 103782, [green label] (INBIO). Paratypes: 1 ♀, Santa Rosa National Park; Guana.[caste] Prov.[incia], Costa Rica; 4–6 July 1979, D. H. Janzen, COSTA RICA: INBIO: CR1109308. 1 ♀, Santa Rosa National Park; Guanacaste Prov.[incia], COSTA RICA, 13–15 Jul[y] 1980; D. H. Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109307. 1 ♀, Santa Rosa National Park; Guanacaste Prov.[incia], COSTA RICA, 7–9 Jul[y] 1980; D. H. Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109309, genitalia slide USNM 105,821 [green label]. 1 ♀, Santa Rosa National Park, Guanacaste Prov.[incia], COSTA RICA, 12–14 May 1980; D. H. Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109310. 1 ♀, Santa Rosa National Park, Guana.[caste] Prov.[incia], Costa Rica, 22–24 Jun[e] 1979, D. H. Janzen, COSTA RICA: INBIO: CRI1109312. 1 ♀, 4km. W.[est] Sta.[tion] Cecilla, Guanacaste Prov.[incia] COSTA RICA, 17 April 1983, 300m; D. H. Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1109311. 1 ♀, P.N. Barra Honda, 3km NW Nacaome, Guanac.[aste] Prov.[incia], COSTA RICA, 100m, Janzen & Hallwachs, 6 Jan. 1989, COSTA RICA: INBIO: CRI103096.

Other specimens examined. MEXICO: 1 ♂, La Gloria, Cardel, VC [Veracruz]; Mex[ico] I-1938, J. Camelo; No. 3518, wing slide USNM 106,423. COLOMBIA: 1 ♂, Atlantico, Cuatro Bocas, 21-I-1959, J. F. G. Clarke, wing slide USNM 106,422; 1 ♂, Atlantico, 200m, Cuatro Bocas, J. F. G. Clarke.

Distribution. Mexico south to northern South America.

Etymology. The specific epithet is derived from the type locality of Santa Rosa National Park.

Parambia Dyar

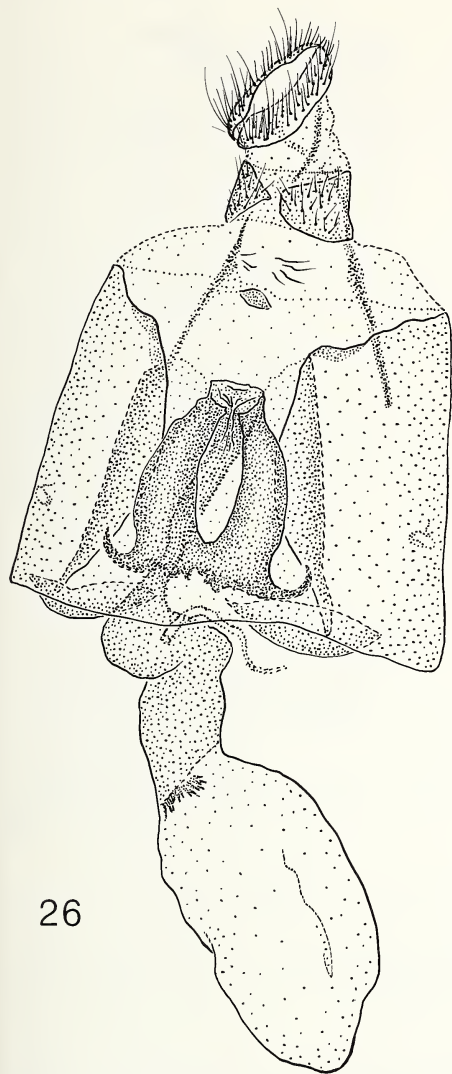
This genus has 4 species. No biological information is available.

Parambia gnomosynalis Dyar

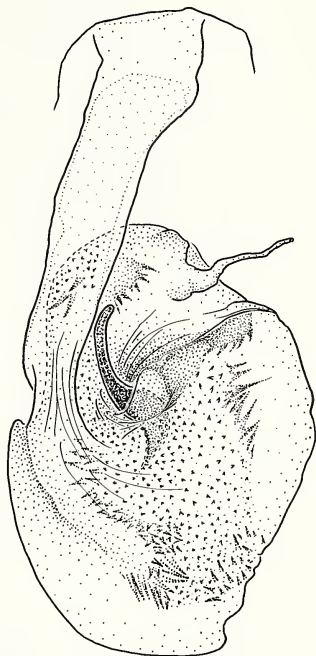
Fig. 66

Parambia gnomosynalis Dyar, 1914:292.

Parambia glenealis Dyar, 1914:292. **NEW SYNONYMY.**



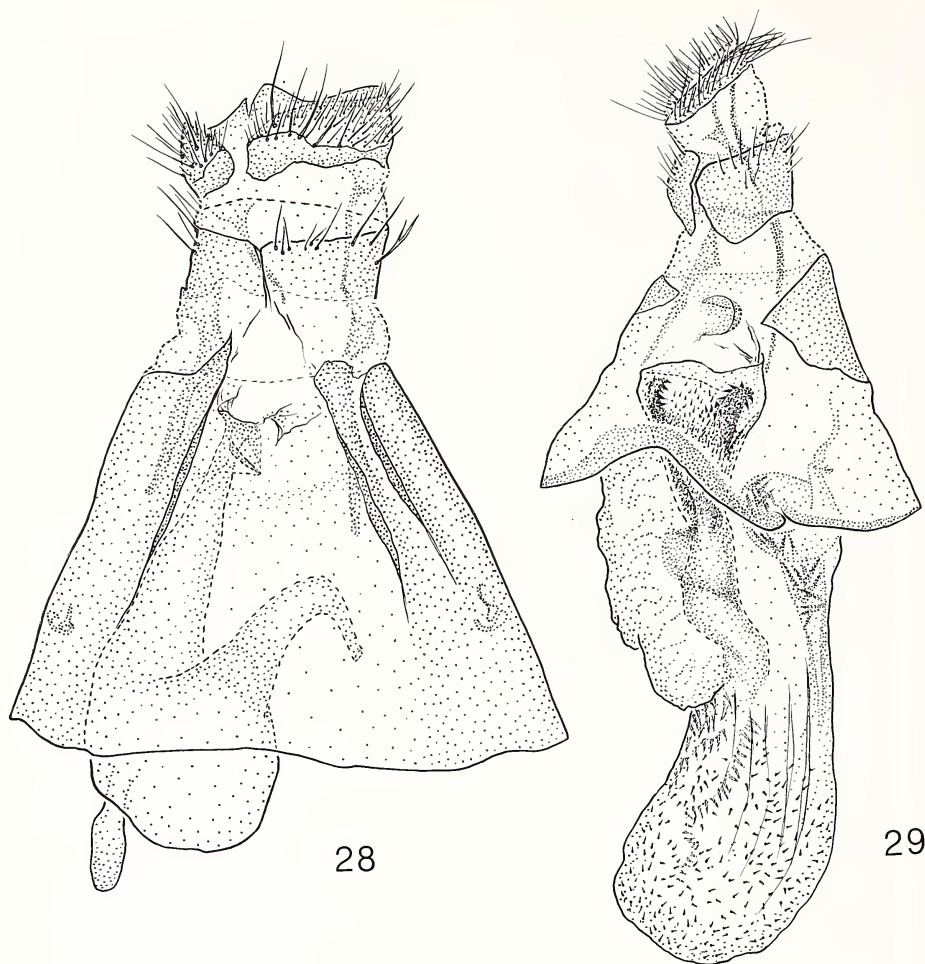
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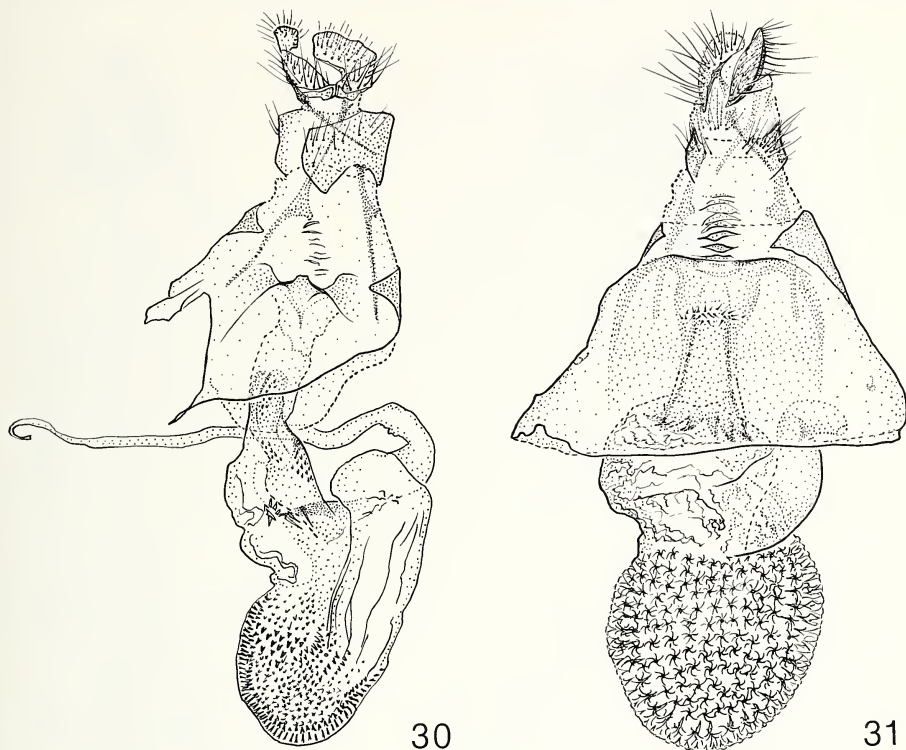
Figs. 26–27. 26. Female genitalia of *Aureopteryx olufsoni*, USNM #103,729. 27. Female genitalia of *Eupoca chicalis* Schaus, USNM #108,108.

Diagnosis. Fore wing with basal fascia white, other wing areas mostly brown. Thorax white. Hind wing mostly brown, subterminal line white; emarginate posterior to M_1 , linear cluster of scales between CuA_2 and CuP , each scale with a white linear base and brown spatulate apex. Costa of valva with one or two small spines at apex; uncus about half length of valva; corntus a row spines entire length of aedeagus. Female genitalia with an irregular row of linear spines within corpus bursae, anterior portion of corpus bursae membranous.



Figs. 28–29. 28. Female genitalia of *Eupoca haakei*, #USNM 107,894. 29. Female genitalia of *Glaphyria spinacrista*, USNM #107,919.

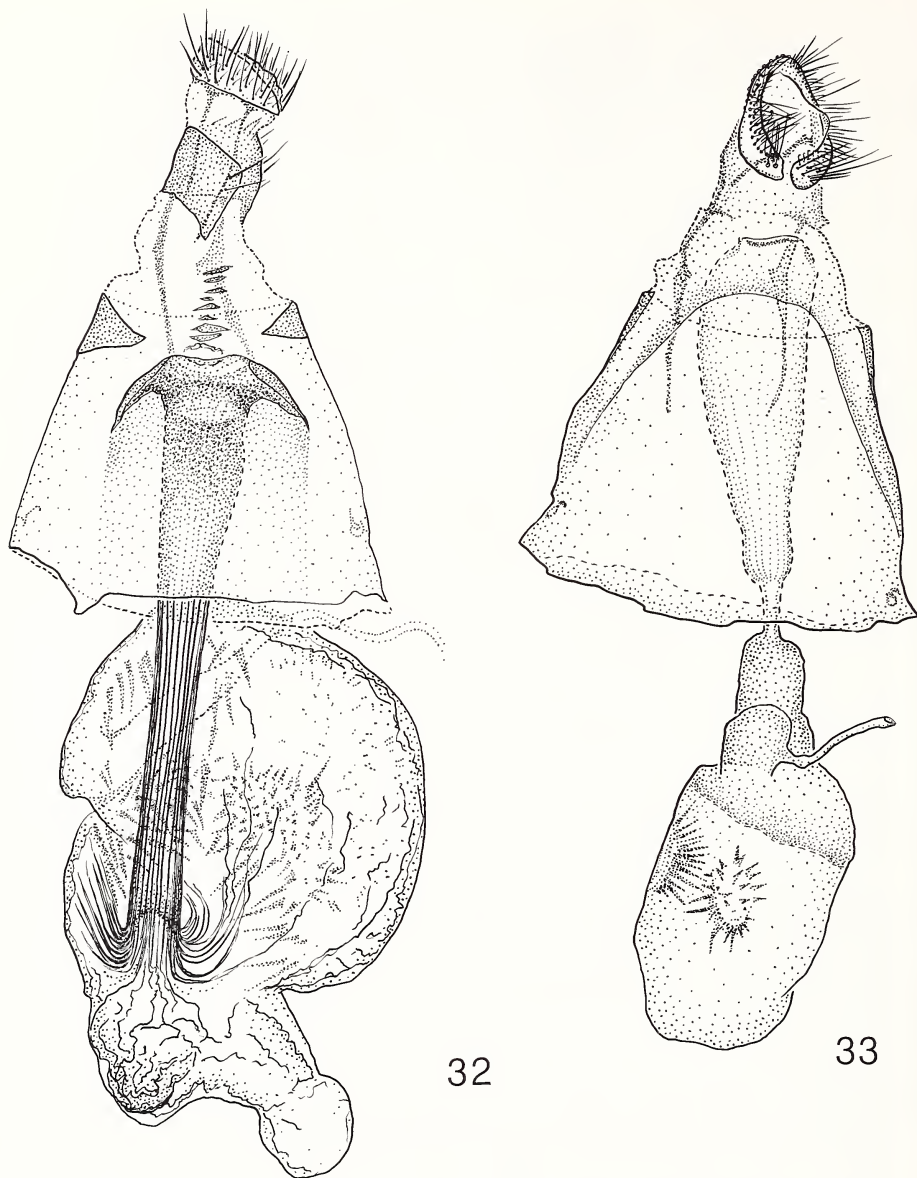
Types. *P. gnomosynalis*, holotype, ♀, Porto Bello, Panama, genitalia slide USNM 107,963 [green label]. *P. glenealis*, holotype, ♀, Corazal, C[anal] Z[one], Pan[ama], genitalia slide USNM 107,968 [green label], Type No. 16197 [red label] (USNM).
Material examined. Holotypes dissected. Other specimens examined: GUATEMALA: 3 ♂♂, 4 ♀♀, Cayuga; COSTA RICA: 1 ♀, 9.4km W Bribri Suretka, 200m, Prov. Limon, COSTA RICA, DH Janzen & W. Hallwachs, 9–11 Jun. 1983, COSTA RICA: INBIO: CRI1115202. 2 ♂♂, 1 ♀, Est. Bijagual, 500m, Res. Biol. Carara, Prov. Puntarenas, L-N-192250-474760, COSTA RICA: INBIO: CRI296257, CRI296339, CRI299424. 1 ♀, same data as above except: Jan. 1991, COSTA RICA: INBIO: CRI452588. 1 ♂, Est. Quebrada, Bonita, 50m, Res. Biol. Carara, Prov. Puntarenas, L-N-194500-469850, R. Zuniga, COSTA RICA: INBIO: CRI349014. 1 ♂,



Figs. 30–31. 30. Female genitalia of *Glaphyria spinasingularis*, USNM #103,785. 31. Female genitalia of *Glaphyria stellaspina*, USNM #105,822.

Est. Sirena, 0–100m, P.N. Corcovado, Prov. Puntarenas, L-S-270500-508300, G. Fonseca, Sept. 1991, COSTA RICA: INBIO: CRI357553. 1 ♂, P.N. Manuel Antonio, 140m, Quepos, Prov. Puntarenas, L-S-371500-449450, G. Varela & R. Zuniga, Oct. 1990, COSTA RICA: INBIO: CRI223326. 1 ♀, Rancho Quemado, 200m, Peninsula de Osa, Prov. Puntarenas, L-S-292500-511000, F. Quesada, Feb. 1992, COSTA RICA: INBIO: CRI345179. 1 ♀, Sector Cerro Cocori, Fca. de E Rojas, 150m, L-N-286000-567500, E. Rojas, Mar. 1991, COSTA RICA: INBIO: CRI181561. 1 ♀, same data as above except: Apr. 1991, COSTA RICA: INBIO: CRI452283. 2 ♀♀, 4km W Sta. Cecilia, Prov. Guanacaste, COSTA RICA, DH Janzen & W. Hallwachs, 3 Jun. 1981, COSTA RICA: INBIO: CRI1115201, CRI1115199, genitalia slide USNM 103,676. 1 ♀, same data as above except: 250m, 25 Feb. 1985, COSTA RICA: INBIO: CRI1115200. 1 ♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, DH Janzen, 12 Dec. 1978–10 Jan. 1979, COSTA RICA: INBIO: CRI1115198. 1 ♂, W of Carmona Nicoya, Prov. Guanacaste, COSTA RICA, 600–700m, DH Janzen & W. Hallwachs, 19 Aug. 1982, COSTA RICA; INBIO: CRI381061, genitalia slide USNM 103,675. 1 ♂, 1 ♀, Turrialba; PANAMA: 1 ♂, Tabernilla (Canal Zone); FRENCH GUIANA: 2 ♂♂, 2 ♀♀, Cayenne.

Distribution. Guatemala south through Central America to northern South America.



Figs. 32-33. 32. Female genitalia of *Glaphyria tetraspina*, USNM #107,936. 33. Female genitalia of *Lipocosma fonsecai*, USNM #107,923.



Fig. 34. Female genitalia of *Lipocosma pitilla*, USNM #107,928.

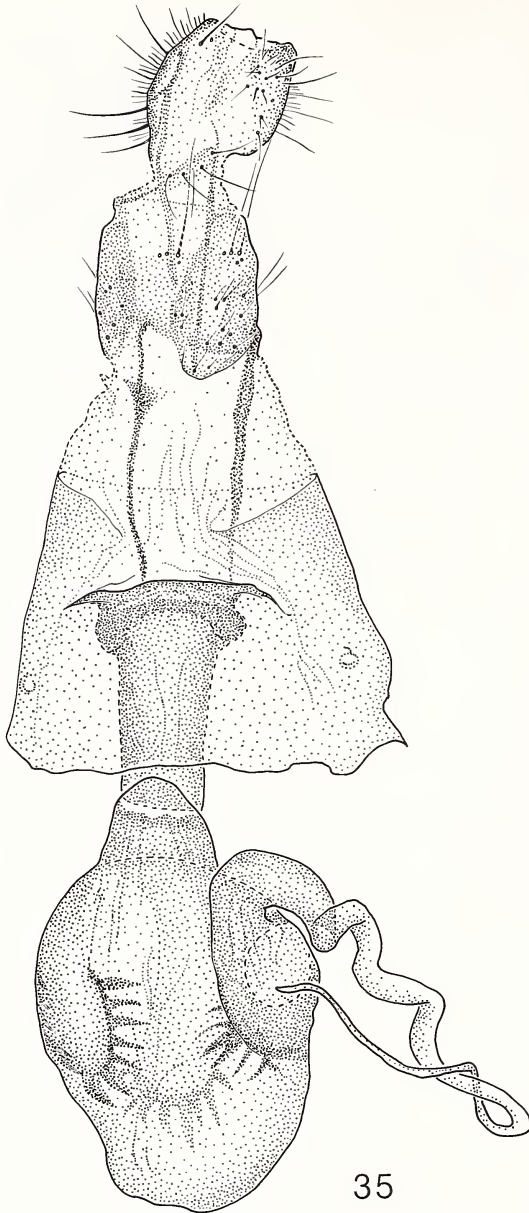


Fig. 35. Female genitalia of *Lipocosma rosalia*, USNM #105,821.

Pseudoliostigma Strand

This genus has 11 species. Three species occur in Costa Rica: *P. argyractalis* (Schaus), *P. enareralis* (Dyar), *P. punctissimalis* (Dyar). No biological information is available.

Pseudoliostigma argyractalis (Schaus)

Fig. 53

Ambia argyractalis Schaus, 1912b:676.

Heptalitha argyractalis Schaus, 1912b; Munroe, 1964:1298. NEW COMBINATION.

Pseudoliostigma argyractalis Schaus, 1912b; Munroe, 1995:44. NEW COMBINATION.

Diagnosis. Fore wing with a medial transverse brown streak from middle of wing to outer margin. Hind wing slightly emarginate beyond M_1 ; a dense cluster of black piliform setae between CuA_2 and CuP ; seven black marginal spots between M_2 and CuA_2 . Seventh sternum narrowly rounded posteriorly; ductus bursae with two linear sclerotizations near base, signum absent.

Type. Holotype, ♀, Juan Vinas, C[osta] R[ica], genitalia slide USNM 107,971 [green label], Type No. 17686 [red label] (USNM).

Material examined. Holotype dissected. Other specimens examined: GUATEMALA: 1 ♀, Chejel. 1 ♀, Cayuga; COSTA RICA: 1 ♀, La Montura, Braulio Carillo Nat. Pk., Prov. San Jose, COSTA RICA, 1100m, DH Janzen & W. Hallwachs, 17 Dec. 1981, COSTA RICA: INBIO: CRI1115163, genitalia slide USNM 103,787. 1 ♀, same data as above except: L-N-236700-541800, 12/17/81, COSTA RICA: INBIO: CRI1115626.

Distribution. Western Guatemala south to central Costa Rica.

Remarks. Male unknown.

Pseudoliostigma enareralis (Dyar)

Fig. 54

Ambia enareralis Dyar, 1914:294. Munroe, 1964:1298. NEW COMBINATION.

Pseudoliostigma enareralis Dyar, 1914; Munroe, 1995:44. NEW COMBINATION.

Diagnosis. Hind wing with seven marginal spots between M_2 and CuP . Large semi-circular fold posterior to ostium bursae and a broad depression posterior to mentioned fold.

Type. Holotype, ♀, La Chorrera, Pan[ama], genitalia slide USNM 107,946 [green label], Type No. 16202 [red label] (USNM).

Material examined. Holotype dissected. Other specimens examined: COSTA RICA: 1 ♀, Sirena, Corcovado Nat. Pk., Osa Peininsula, COSTA RICA, 1 May 1984, DH Janzen & W. Hallwachs, COSTA RICA: INBIO: CRI1115164, genitalia slide USNM 103,788. 1 ♀, 2 km W sta. Cecilia, Prov. Guanacaste, L-N-338700-541800, DH Janzen, 12/25/84, COSTA RICA: INBIO: CRI1106281. 1 ♀, Est. Bijagual, 500m, Res. Biol. Carara, Prov. Puntarenas, L-N-192250-474760, R. Zuniga, Sept. 1990, COSTA RICA: INBIO: CRI299598. 1 ♀, Est. Pitilla, 700m, 9 km S Sta. Cecilia, P.

N. Guanacaste, Prov. Guanacaste, L-N-330200-380200, C. Moraga & P. Rios, Dec. 1989, COSTA RICA: INBIO: CRI190648. 1 ♀, Est. Sirena, 0–100m, P.N. Corcovado, Prov. Puntarenas, L-S-270500-508300, G. Fonseca, Apr. 1991, COSTA RICA: INBIO: CRI288713. 1 ♀, P.N. Manuel Antonio, 120m, Quepos, Prov. Puntarenas, L-S-370900-449800, G. Varela & R. Zuniga, Nov. 1990, COSTA RICA: INBIO: CRI218911. 1 ♀, same data as above except: COSTA RICA: INBIO: CRI218880. 1 ♀, Rancho Quemado, 200m, Peninsula de Osa, Prov. Puntarenas, L-S-292500-511000, F. Quesada, Dec. 1991, COSTA RICA: INBIO: CRI483313. 1 ♀, Sector Cerro Cocori, Fca. de E. Rojas, 150m, Prov. Limon, L-N-286000-567500, E. Rojas, Mar. 1991, COSTA RICA: INBIO: CRI181611. 1 ♀, same data as above except: May 1992, COSTA RICA: INBIO: CRI373516. 1 ♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, DH Janzen, 4–6 Dec. 1979, COSTA RICA: INBIO: CRI1115166. 1 ♀, Est. Hilttoy-Cerere, Res. Biol. Hilttoy Cerere, Rio Cerere, 200m, Prov. Limon, L-N-184200-643300, COSTA RICA: M. Borrelie, Nov. 1990, COSTA RICA: INBIO: CRI384293. 1 ♀, Estac. Bijagual, 500m, Res. Biol. Carara, Prov. San Jose, L-N-192250-474760, COSTA RICA, R. Zuniga, Dec 1989, COSTA RICA: INBIO: CRI1617.

Distribution. Costa Rica south to central Panama.

Remarks. Male unknown.

Pseudoliostigma punctissimalis (Dyar)

Figs. 3–4, 55

Lipocosma punctissimalis Dyar, 1914:258.

Pseudoliostigma punctissimalis Dyar; Munroe, 1995:44. NEW COMBINATION.

Lipocosma teliferalis Dyar, 1914:258. NEW SYNONYMY.

Diagnosis. Fore wing with a large dark grayish-brown area proximal to subterminal line. Hind wing deeply emarginate posterior to M_1 ; seven black marginal spots between M_2 and CuP; several dark brown piliform scales overlaid by a small cluster of erect squamiform dark brown scales between CuA_2 and CuP. Valva with a recurved costal projection at base; juxta with two linear dorsal projections and a ventral support that bifurcates laterally; cornutus with several spines distally bifurcate. Posterior margin of seventh sternum slightly emarginate, anterior to spiracle; corpus bursae sclerotized near inception of ductus seminalis; signum absent.

Types. *L. punctissimalis*, holotype, ♂, Isl[and], Pan[ama], genitalia slide USNM 107,969 [green label], Type No. 16171 [red label] (USNM). *L. teliferalis*, holotype, ♂, Taboga Is., Pan[ama], genitalia slide USNM 107,950 [green label], Type No. 16172 [red label] (USNM).

Material examined. Holotypes dissected. Other specimens examined: COSTA RICA: 1 ♀, Fca. Jenny, 30km N de Liberia, P.N. Guanacaste, Prov. Guanacaste, L-N-316200-364400, R. Espinoza, Jul. 1991, COSTA RICA: INBIO: CRI332418. 1 ♀, Est. Sirena, 0–100m, P.N. Corcovado, Prov. Puntarenas, L-S-270500-508300, G. Fonseca, Nov. 1991, COSTA RICA: INBIO: CRI351784. 1 ♂, P.N. Manuel Antonio, 80m, Quepos, Prov. Puntarenas, L-S-370900-448800. 1 ♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA, DH Janzen, 4–6 Dec. 1979, COSTA RICA: INBIO: CRI1115166. 1 ♀, Est. Hilttoy-Cerere, Res. Biol. Hilttoy Cerere, Rio Cerere,

200m, Prov. Limon, L-N-184200-643300, COSTA RICA: M. Borrelier, Nov. 1990, COSTA RICA: INBIO: CRI384293. 1 ♀, Estac. Bijagual, 500m, Res. Biol. Carara, Prov. San Jose, L-N-192250-474760, COSTA RICA, R. Zuniga, Dec 1989, COSTA RICA: INBIO: CRI1617. 1 ♀, Santa Rosa National Park, Prov. Guanacaste, COSTA RICA: DH Janzen, 12 Dec. 1978–10 Jan. 1979, COSTA RICA: INBIO: CRI115192, genitalia slide USNM 103,674. PANAMA: 1 ♀, Porto Bello. 3 ♂♂, 1 ♀, Taboga Is.; TRINIDAD: 1 ♀, Fyzabad.

Distribution. Northwestern Costa Rica south to Panama including Trinidad.

Stegea Munroe

This genus has 11 species; only one species, *S. hermalis* (Schaus) occurs in Costa Rica. No biological information is available.

Stegea hermalis (Schaus)

Fig. 67

Symphysa hermalis Schaus, 1920:176; Munroe, 1995:43. NEW SYNONYMY.

Diagnosis. Fore wing brown, lines faint. Hind wing usually darker in cubital and anal areas than fore wing. Hind wing area between CuA_2 and CuP with or without spatulate scales. Pseudognathos present; costa of valva with a recurved projection near base and one spine apically; vinculum highly sclerotized, elongated and bifurcate anteriorly; juxta with three stout spines. Posterior part of antrum as wide as seventh sternum; ductus bursae partially sclerotized longitudinally, anterior portion of corpus bursae with peglike spines with stellate bases, a deep, pouchlike structure between seventh sternum and spiracle.

Type. Holotype, ♀, Cayuga, Guat[emala], genitalia slide USNM 107,972 [green label], Type no. 23527 [red label] (USNM).

Material examined. Holotype dissected. Other specimens examined: MEXICO: 1 ♂, 6 ♀♀, La Gloria. 1 ♀, Orizaba. 1 ♀, Colima. 1 ♀, Tehuacan; GUATEMALA: 1 ♂, 5 ♀♀, Cayuga; COSTA RICA: 1 ♂, Finca La Selva (OTS), Puerto Viejo de Sarapiquí, 50m, Prov. Heredia, COSTA RICA, DH Janzen & W. Hallwachs, 6–9 Mar. 1985, COSTA RICA: INBIO: CRI115203, genitalia slide USNM 103,796. 1 ♂, Cerro Tortuguero, P.N. Tortuguero, Prov. Limon, L-N-285000-588000, J. Solano, Apr. 1989, COSTA RICA: INBIO: CRI1103069. 1 ♀, Juan Vinas; PANAMA: 1 ♀, La Chorrera. 1 ♀, Corazal (Canal Zone).

Distribution. Southern Mexico south to Panama.

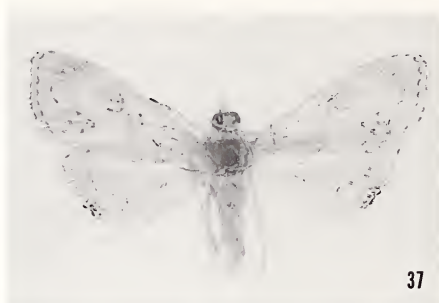
Remarks. Hind wing area between CuA_2 and CuP with or without spatulate scales, consequently this species can be found in two different parts of key.

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We thank E. Munroe for making his work in progress available to us and inspired the collection of many of these moths by D. Janzen and W. Hallwachs as part of the NSF-supported "Moths of Costa Rica" project. We thank J. Minet, Muséum National d'Histoire Naturelle, Paris, France, for his comments on English terminology for tympanal organ structures and M. Shaffer, The Natural History Museum, London, England, for his hospitality during many visits. We would like to thank Susan Escher for the illustrations. This study has been supported by



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Figs. 36–43. 36. *Aureopteryx argentistriata* (Hampson), Wing length = 7 mm. 37. *Aureopteryx olufsoni* Solis & Adamski, Wing length = 6 mm. 38. *Chilozela trapeziana* (Sepp), Wing length = 12 mm. 39. *Cosmopterosis thetysalis* (Walker), Wing length = 7 mm. 40. *Dicomolomia metalophota* (Hampson), Wing length = 4 mm. 41. *Eupoca bifascialis* (Walker), Wing length = 9 mm. 42. *Eupoca chicalis* (Schaus), Wing length = 5 mm. 43. *Eupoca haakei* Solis & Adamski, Wing length = 8 mm.



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Figs. 44–51. 44. *Eupoca sanctalis* (Schaus), Wing length = 8 mm. 45. *Glaphyria citronalis* (Druce), Wing length = 6 mm. 46. *Glaphyria decisa* (Walker), Wing length = 7 mm. 47. *Glaphyria rufescens* (Hampson), Wing length = 8 mm. 48. *Glaphyria spinacrista* Solis & Adamski, Wing length = 6 mm. 49. *Glaphyria spinasingularis* Solis & Adamski, Wing length = 4 mm. 50. *Glaphyria stellaspina* Solis & Adamski, Wing length = 5 mm. 51. *Glaphyria tetraspina* Solis & Adamski, Wing length = 6 mm.



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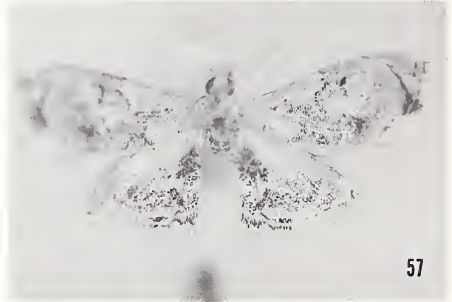
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Figs. 52–59. 52. *Hellula phidilealis* (Walker), Wing length = 6 mm. 53. *Pseudoligostigma argyractalis* (Schaus), Wing length = 7 mm. 54. *Pseudoligostigma enareralis* (Dyar), Wing length = 6 mm. 55. *Pseudoligostigma punctissimalis* (Dyar), Wing length = 4 mm. 56. *Homophysodes morbidalis* (Dyar), Wing length = 4 mm. 57. *Lipocosma albibasalis* (Hampson), Wing length = 6 mm. 58. *Lipocosma ausonialis* (Druce), Wing length = 6 mm. 59. *Lipocosma ausonialis* (Druce), Wing length = 7 mm.



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Figs. 60–67. 60. *Lipocosma calla* (Kaye), Wing length = 5 mm. 61. *Lipocosma fonsecai* Solis & Adamski, Wing length = 4 mm. 62. *Lipocosma furvalis* (Hampson), Wing length = 5 mm. 63. *Lipocosma nigripictalis* Hampson, Wing length = 7 mm. 64. *Lipocosma pitilla* Solis & Adamski, Wing length = 5 mm. 65. *Lipocosma rosalia* Solis & Adamski, Wing length = 5 mm. 66. *Parambia gnomosynalis* Dyar, Wing length = 5 mm. 67. *Stegea hermalis* (Schaus), Wing length = 5 mm.

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